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GAME DESIGN | CODING | ART | SOUND | BUSINESS

STAND OUT IN VR

INDUSTRY VETERANS WEIGH IN ON THE STATE OF VR AND ITS OUT-OF-HOME FUTURE

Art: XXXXXXXXXXXXXXX

LUDUM DARE ■ GAMEMAKER STUDIO 2 ■ SPIRITAI

AT A GLANCE

APRIL 14TH & 16TH

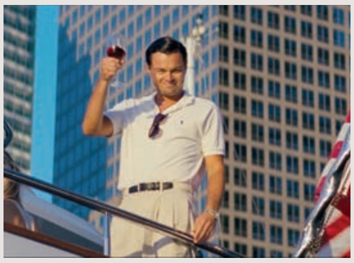
Good Friday and Easter Sunday

An eggcellent time of year for those who like chocolate bunnies

APRIL 28TH

Mario Kart 8 Deluxe

You know, that Mario game for the Switch that isn't *Odyssey*



MAY 1ST

May Day Bank Holiday

Poles, morris dancers and bankers taking time off - any connections?

MAY 5TH

Prey

Arkane and Bethesda's second attempt at the *Prey* IP, which involves polymorphing

DIARY DATES

SEARCH FOR A STAR

SEARCH FOR A STAR FINALS AND CONFERENCE
April 10th & 13th
www.gradsingames.com

APRIL

VR World Congress 2017
April 11th-13th, Bristol, UK
vrworldcongress.com

VRLA Expo 2017
April 14th, Los Angeles, California
virtualrealityla.com/expo-2017

Games Week Denmark
April 19th, Copenhagen, Denmark
gamesweek.dk

A MAZE./ Berlin 2017
April 26th, Berlin, Germany
amaze-berlin.de

Tehran Game Convention
April 29th, Tehran, Iran
tehrangamecn.com.

MAY

FMX
May 2nd, Stuggart, Germany
fmx.de

VRX Europe 2017
May 11th, Victoria Park Plaza Hotel, London
events.vr-intelligence.com/europe/

EVENT SPOTLIGHT

NORDIC GAME 2017
Where: Slagthuset, Malmo, Sweden
When: 17-19th May, 2017
What: An annual games confrence for the European game development including an expo and game awards
conf.nordicgame.com

COMING SOON

DEVELOP #182

THE VISUAL ARTS ISSUE

We'll take a look at the visual arts sector of the games industry including concept art, new technologies and interviews on the future of graphics in gaming.

XBOX ONE
XBOX ONE S
PROJECT SCORPIO
XBOX

DEVELOP #183

THE E3 ISSUE

It's that time of year again and, frankly, it promises to be a big one. Scorpio, new IPs and who knows if The Last Guardian will get a rele... wait, that's last year's joke.

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develop is published 11 times a year by NewBay Media Europe Ltd, The Emerson Building, 4th Floor, 4-8 Emerson Street, London SE1 9DU

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Printed by Pensord Press Ltd, NP12 2YA
Print ISSN 1365-7240
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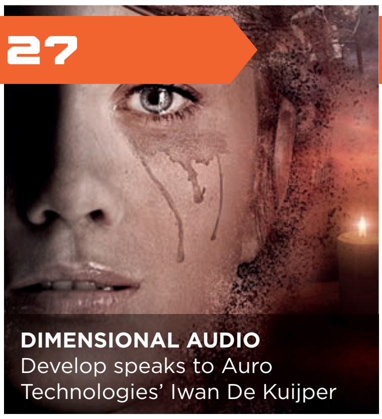

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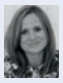

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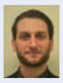

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Editorial

There are way too many games. A steady flow of quality releases so far this year has meant it's been incredibly difficult trying to keep up.

Perhaps we need an industry-wide holiday – just for a month or so – to allow us to catch up and reflect on all of the incredible games from the last six months.

There's no sign of it slowing down, either. *Destiny 2* has now been officially announced, with a fantastic teaser trailer. One that brings to mind everything that Bungie fixed in the game with the release of its expansion *The Taken King*. Humour, character and dialogue that doesn't sound like it was written at the last minute by the nephew of someone on the dev team.

> **Perhaps we need an industry-wide holiday to catch up on all of the incredible games**

For a short trailer, just a few minutes long, to quell my fears so absolutely tells me that Bungie knows what they're doing this time. After all, there's no reason to assume that the minute-to-minute gameplay is going to be any less addictive and rewarding as the original.

This issue of the magazine revisits the world of VR properly for the first time since our VR special last year. We've checked in with a range of developers to see how they feel about the tech's place in the industry, six months on. Between consistent 'quality game releases, as mentioned above, and the potential for VR to bring new experiences to both the living room and the out-of-home market, there's something for everyone to get excited about this year.

Jem Alexander
jalexander@nbmedia.com

EXPERIENCE **POINTS**

2017 is shaping up to be one of the best years in gaming history, but there's something on the horizon that's getting **Jem Alexander** even more excited than the recent slew of fantastic games

I've spent the last month talking to people in the industry about VR's potential and its continued momentum over the next couple of years; the fruits of which can be found in our big virtual reality feature, starting on page 7.

As someone who bought into the concept of VR at an early stage, I'm eager to see what happens next. I played *Resident Evil VII* through entirely in VR and absolutely adored it. It's the best way to play the game, as long as you can overcome both the intensely intimate fear that only the VR experience offers and any potential motion sickness. It's also the very best virtual reality experience I've ever had, full stop.

But if the best VR game out there is a 'port' of a 'traditional' game, what does that say about the technology's potential as a whole new gaming medium? It's difficult, because this is such a stellar year for 'traditional' experiences, it almost feels like we don't need VR to get us excited.

The last few years have been relatively lacklustre, when it comes to traditional games. Sequels and remasters and a distinct feeling of "I've played this before", which is fine. Nostalgia is great. We all had formative games that we're happy to replay (and, indeed, repay). Comfort gaming is never going to go away and VR can never be a replacement for that. Although in 20 years time maybe I'll be writing wistfully about *Resident Evil VII* and its recent re-release on the Holodeck 4.0.

My point is, I think, that this year's screen-based games are doing more to reinvigorate my love of gaming than anything else in the last few years. Between *Zelda*, *Resi VII*, *Mass Effect*, *Horizon*, *Persona 5*, *Yooka-Laylee*, *Nier Automata*, *Thimbleweed Park*, *Torment: Tides of Numenera*, *Yakuza 0* and others, 2017 is offering an embarrassment of riches. We're three months deep and we've already got a strong top ten list right there. It's frankly ludicrous and I love it.

NEW EXPERIENCES

But the conversations I've been having around VR are getting me excited in a whole new way about potential new experiences that aren't taking place in my living room. I've been noticing a definite increase in the number of escape room games opening in London over the last year or two. It feels like every month a handful of new escape rooms open in the capital and it's getting tricky (and expensive) to catch up with them all. For the uninitiated the idea of an escape room is that you and your friends are physically locked in a room with a series of themed puzzles to solve which will lead to your freedom. Funnily enough, a piece of *Resident Evil VII* DLC, 'Bedroom', is a perfect example of an escape room brought into the digital realm.

> **"I can't explain my excitement around out-of-home VR, escape rooms and the possibilities of a mixture of the two**

They speak to a growing (or perhaps long-dormant?) desire in people to participate in team-based experiences with real, actual friends and surely it won't be long before this coalesces with the world of VR. Or perhaps it will be AR. The important thing is that these games require presence. Not interacting on the same digital server, but in the same meat space. The addition of a digital layer will allow the storytelling and puzzle solving to be expanded and improved, in much the same way digital card games like *Hearthstone* and *Hex* improve on their paper versions.

I've discovered through the writing of this article that I can't really explain my excitement around out-of-home VR, escape rooms and the possibilities of a mixture of the two. I've been banging this drum ever since GDC, when I spoke to escape room designers and VR tech providers who fanned the flames of desire in me and now it's all I can think about. Even while I'm playing some of the very best traditional experiences I think our industry has ever seen. ■

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THE NOSTALGIC SPRING

This season sees the release of many games with names we know and love, but **Sean Cleaver** wonders why games receive less criticism for the constant remasters and reboots than Hollywood does

You might come across it nowadays as one of those interesting asides at a pub quiz, but nostalgia was for a time thought of as a disease that lead to melancholic feelings. For Queen Elizabeth I it was not considered a good thing for your subjects to be wistfully thinking back to happier times, when your father was doing your job.

I mention this because April, and even a small part of March, has very much been marketed with nostalgia in mind. *Mass Effect: Andromeda* builds on the love for a series with a huge fanbase, even though the developers concluded its narrative arc four years ago. By the time this issue of the magazine reaches you, *ParRappa the Rapper Remastered* will be out and *Thimbleweed Park*'s love letter to the point and click genre will also appear. Later this month, classic platformer inspired *Yooka-Laylee* will hit shelves, Double Fine will give us another remaster in *Full Throttle*, and both *Micro Machines* and *Constructor* will return as well.

This sounds like I'm setting myself up for this to be a negative, which I don't necessarily think it is, but there is a potential danger in focusing on retreading old ground. To help make my point, I'll direct your attention to our celluloid entertainment brethren over in Hollywood.

THE MATRIX REBOOTED

Who in their right mind reboots *The Matrix*? This conversation seems to happen quite often and it is infuriating that ideas seem to be stuck in a cycle of repetition. I can understand why it happens, though.

If you're a studio looking to make a commercially successful entertainment product by taking advantage of previously unavailable technology and directors and actors already on your books, then it makes sense to greenlight scripts with established characters, whack in some VFX and ride the wave of nostalgia all the way to the bank. For example: *Power Rangers*, *Beauty and the Beast*, *Ghost in the Shell* and *Kong Skull Island*. There's even a re-release of *Donnie Darko* in 4K.

The games community seems to have less of a problem with this recreation or rebooting of IPs than film, but as a friend of mine complained to me recently “I've become less of a gamer because they're not doing anything new, though that sometimes works for me because I know what I like.”

THE REBOOTED AND THE REMASTERED VIII

My friend is both right and wrong. Of course games are doing new things, and not just in the way the industry uses and develops technology. The blurring of lines between triple-A and indie development, the narrative explorations we now enjoy and the evolution of portable gaming (mobile or console) are far more positive for our industry than it is constricting.

> “The games community seems to have less of a problem with this recreation or rebooting of IPs than film

There are definitely more new games than there are remasters, but that does include sequels. However, a sequel, or an instalment in a franchise, is much more forgiving and has a lot more growth potential than our cousins on the big screen.

We take a great deal of pride in progress in games, both in terms of technology and diversity. While sequels have a dedicated audience of fans, they are also chances for us to try and adapt to new technologies, engine improvements and the unleashing more graphical and processing power.

It's nice that games can occupy both sides of this bridge, compared to other mediums that are constantly criticised for churning out derivative or unoriginal products. But at the same time people know what they like.

That doesn't mean that people don't try new things and maybe that's the job of a critic in the modern age. To highlight games' successes and broaden the minds of players, steering them towards games they wouldn't otherwise play while they wait for annual instalments of their favourite franchises.

It's tricky ground to tread though and gaming nostalgia is, while an integral part of being a gamer in my own personal view, not tarred with the melancholy about the media and the franchises that are rebooted or remastered.

Unless Reddit isn't happy in which case DRTC:

Don't read the comments. ■

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VR CHECK-IN

Six months on, VR is now in the eager claws of gamers. **Jem Alexander** investigates how developers feel about its reception and where the tech goes next

Now...

As with any highly anticipated product, whether hardware or software, it's easy to feel like its eventual release is something of an anticlimax. With almost five years of hype, VR has been 'the next big thing' for longer than we've owned our PlayStation 4s. So now, six months after the PlayStation VR and Oculus Rift have shipped to actual, real gamers in the honest-to-goodness marketplace, it's not surprising that some feel the temperature has cooled on the tech throughout the industry.

At least, that's the perception. Though many developers I spoke to are still very excited about virtual reality from both a creative and commercial perspective.

"2016 was the year of virtual hype whereas 2017 is the year of actual realities, in terms of what is achievable from a business sense related to market size, opportunities and potential revenues," says Sam Watts, director of immersive technologies at Make Real. "Should developers or publishers get involved now? Absolutely but with an intelligent approach and realistic expectations of what these early days sales returns could be."

Owen O'Brien, CCP Newcastle's Executive Producer on *EVE: Valkyrie*, is in agreement. "VR is still attractive, as long as you go into it with your eyes open, a clear strategy and set your budget accordingly," he says. "It definitely continues to be attractive for CCP – we made a deliberate decision to get in on the ground floor with VR, making sure we were there with strong, genre-defining titles at each headset launch. We now have a raft of experience in all types of VR with teams able to develop games for mobile, seated and standing VR. We feel very well positioned to adapt as the market continues to grow."

This desire to 'get in on the ground floor' is echoed by many other developers, who see developing skills in VR game creation as a long-term investment rather than a short-term money spinner. One of the benefits of this is that there is relatively little competition, and a userbase that is hungry for more content.

"The VR market still feels relatively new," says Stephanie Bazeley, a programmer at Scottish indie developer Team Junkfish. "This makes it quite an attractive area for development, especially for indies. The level of competition there is currently low, so it's easier for a developer to get their game seen; this is particularly appealing to small and start-up companies who might otherwise struggle with marketing."

> **VR is still attractive, as long as you go into it with your eyes open**
> *Owen O'Brien,*
> *Executive Producer*
> *CCP Newscastle*

THE VR DREAM

Low competition is certainly a boon for indies, but it's also possible that some had been sold a false dream of ballooning markets. James Svensson, producer at Criterion on the X-Wing Tie Fighter VR Mission for *Star Wars Battlefront*, explains it better: "I do get the impression that there's a lot of independents who had this great promise of the VR market exploding and we saw all these different predictions of the future that show all these huge exponential graphs," he says. "So if you've poured a lot of your personal money and time into it and you're making an independent studio go bankrupt for it, that's a really harsh thing. That might be a bit of a reality check for some of that first wave. But I don't think it's waned, just maybe a bit more cautious from a financial point of view. The passion for making VR games is still there."

The perception of waning interest seems to stem, at least in part, from the fact that VR tech, particularly PlayStation VR, is still pretty hard to get hold of. "Sony went really big and had a lot of content available from the start," Svensson says. "But because they've been fairly consistently sold out, it looks like they're not spending much marketing money on it. It all goes together to paint this picture that Sony isn't really interested in VR because you don't see anything very visible from them in terms of them pushing it."

THE GAMES ARE COMING

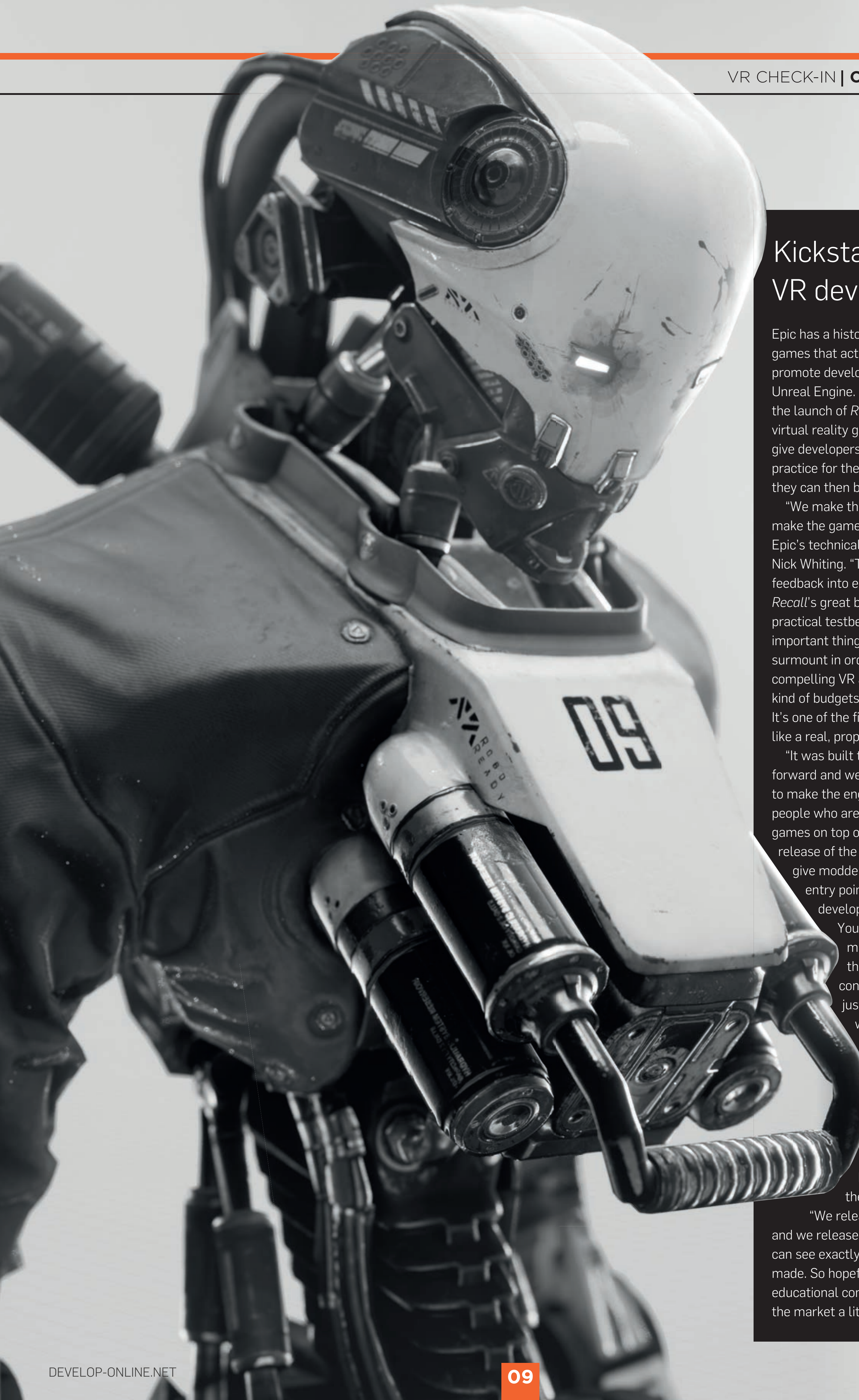
A lack of new content since that launch glut may also appear concerning, but Epic's technical director for VR/AR, Nick Whiting, explains that this is simply down to late started development cycles. "I think what's worth noting is Oculus, Sony and HTC all waited a long time before they announced their price points and release dates," he says. "That made a lot of the traditional publishing or funding vehicles very hesitant to actually start committing money to it. So the traditional AAA funding pipeline, it usually takes two years to build a product from when you actually get the funding to actually delivering the product. Those guys got a very late start compared to a new console cycle, where there's set projections. So I still think we have six months to a year before all the traditionally funded vehicles for applications start coming out and seeing the light of day. That's why this year and next year are going to be the big application cycles, particularly in the consumer entertainment division."

CEO of Epic, Tim Sweeney, agrees. "You'll see some killer apps start to come out and that will see hardware sales go up exponentially."

Thanks to the number of VR headsets available, these hardware sales will continue to fragment the market, though the developers I spoke to believe this can be a good thing for VR development. "I'm optimistic that VR has proven itself viable enough to attract enough developers into the space to maintain its momentum," says Rebellion's lead designer on *Battlezone VR*. "PlayStation reports being very happy with PSVR's performance so far and as a multi-format studio there's opportunity for us to bring our PSVR launch game *Battlezone* to other headsets as well. That must be appealing to other game studios too."

Simon Barratt, owner of Cooperative Innovations, believes fragmentation benefits developers. "We are going to experience a bit of fragmentation in terms of the available headsets and controllers on PC," he says. "But this is a positive thing for us to quickly iterate as an industry, in my opinion, and developers can work to provide the best experience for each. Fragmentation is critical for the market in terms of allowing the hardware to iterate and to see what does and doesn't resonate with the user base and development community. I don't think it's a major problem for game developers generally, we've been used to working with multiple platforms and different input schemes or optimisation methods for a long time."

"With *EVE: Valkyrie*, we did not see it as fragmentation as much as more potential platforms and customers," says O'Brien. "That is why we pioneered cross-platform play between all the major VR headsets. We'd designed the game to be platform-agnostic from the get-go, as we wanted to ensure we had as many players in our matches as possible. That's a tall order for a multiplayer game in a completely new medium, so we took every opportunity to widen our reach."



Kickstarting VR development

Epic has a history of releasing games that actively help and promote development within the Unreal Engine. This continues with the launch of *Robo Recall*, a free virtual reality game that aims to give developers a level of best-practice for the medium on which they can then build.

"We make the engine and we make the games on top of it," says Epic's technical director for VR/AR, Nick Whiting. "These things feedback into each other. *Robo Recall*'s great because we had a practical testbed to see what are the important things that we need to surmount in order to make a compelling VR app. What are the kind of budgets we can work with? It's one of the first games that feels like a real, proper shooter.

"It was built to push the market forward and we used it as a test bed to make the engine better for other people who are trying to bootstrap games on top of it. And with the release of the modding support, give modders a nice convenient entry point. Because VR development is really hard. You have to not only make frame rate, but there's all these design considerations that we just haven't had to deal with in games. So with modding you can start tweaking little bits and pieces of it and it's a safe test bed to toe dip into the water and hopefully give people the skills to rip it apart.

"We released the source code and we released the assets, people can see exactly how the sausage is made. So hopefully it's a very educational component to bootstrap the market a little bit."

> **It's great to have competition and it encourages each headset manufacturer to innovate and improve VR**
>
> *Lukas Roper*
> *Freelance developer*

Freelance games developer Lukas Roper sees competition between hardware manufacturers as a boon for gamers and devs alike. "It's great to have competition and it encourages each headset manufacturer to innovate and improve VR," he says. "Which ultimately improves the medium as a whole. As a developer, trying to work out who to sell to however, you have to focus on those with the largest install base and any headsets that have 'momentum'.

"However, as much as engine developers and headset manufacturers present supporting a headset as a simple task, it isn't, and for each platform you support, you have separate issues to consider."

It's a problem now, during the early part of the tech's life cycle, but ultimately for someone playing VR games, this fragmentation will eventually be as inconsequential as picking a brand of TV. "We'll actually see a distinguishing point," says John Riccitiello, CEO of Unity. "It'll be a little bit like, you know, I've got a Sony TV and you've got a Samsung TV. Do you really care about the underlying technology? I guess I sort of care if it's a steam oven. But ultimately I care if the food tastes good."

SEATED VS ROOM SCALE

The biggest difference at the moment between headsets is their input methods and whether they can support room scale experiences or not. This has created a rift in the dev community between those creating seated, pad-based VR games and those creating fully bespoke room scale VR experiences.

"Right now, if you want maximum commercial viability, your design would ideally suit a sat down experience such as *Elite Dangerous*," says Lukas Roper. "Where you can hone an excellent experience for both platforms and reap the benefits."

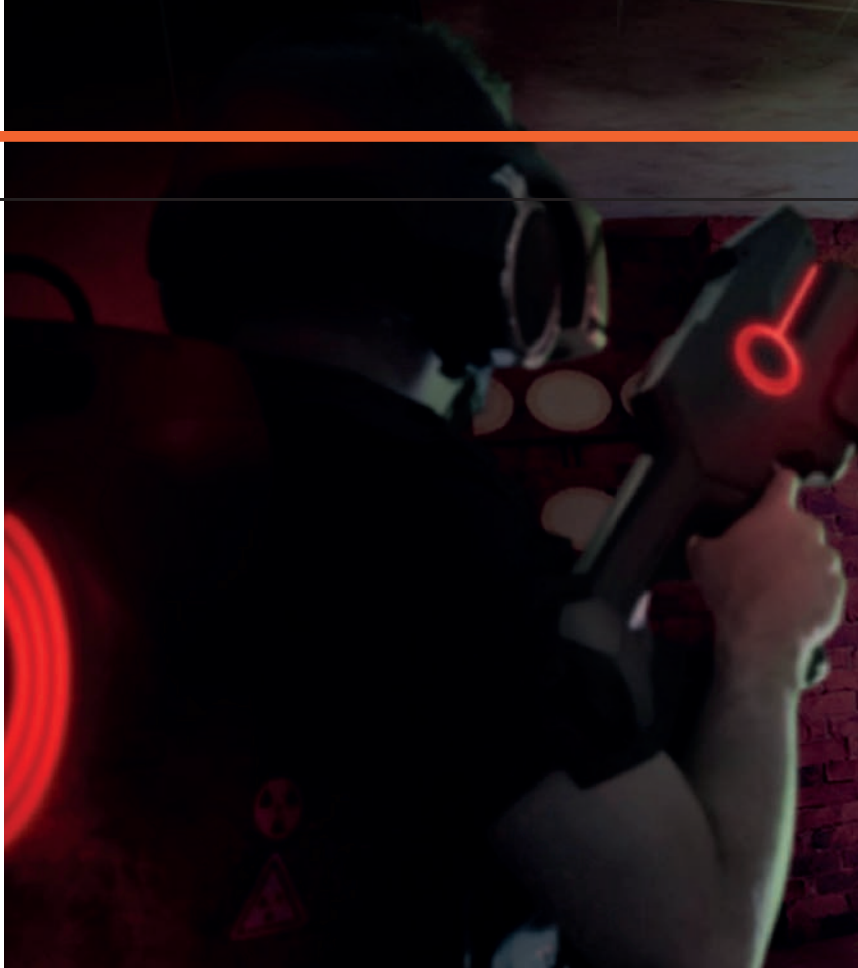
Seated experiences are both more accessible and more comfortable. *Resident Evil VII* has set the bar pretty high when it comes to virtual reality gaming, but at the end of the day it's a port of a 'traditional' game. Is that the best we can hope for when it comes to at-home virtual reality?

"On Vive through Steam and maybe a lesser extent Oculus, there's a wealth of content from a whole range of different backgrounds, so that's still a very active market for people to seek out the types of content they enjoy," says Criterion's Svensson. "Whereas yeah, maybe to some extent you're right with Sony, in that *Resi* has set this bar of saying 'you can have this full console experience available in VR'. From the seated console perspective, I don't think that's a bad thing at all."

Freelance designer Tom Sandford believes there's plenty of room for both. "The purpose of the experience is key," he says. "If it's relatively passive, seated is fine, but if immersion is a priority, nothing beats room scale."

CCP's O'Brien also expects both to coexist simultaneously: "I don't think large audience size and bespoke VR experience have to be mutually exclusive. Not everyone has enough space for room scale of course, but equally you can create a bespoke VR experience that is seated. It totally depends on the market you are going after. At CCP we are pushing forward on both fronts, with *EVE: Valkyrie* being the seated experience and *Sparc* our standing experience."

O'Brien touches on an important point. Most people don't have the space to accommodate room scale in their homes. This is a potentially huge issue for the technology. If people aren't willing or able to set up dedicated VR spaces, where do we go from here? ■



As we've established over the last few pages, developers are still excited to develop for VR because of the creative potential available in a fresh new medium. The downside to virtual reality's youth is its clunky, inelegant and expensive hardware, but eventually VR tech will be lightweight, easy to use and won't make you look like a Doctor Who villain.

Unity CEO John Riccitiello sees VR really taking off in a year or two. "It's going to come together, but probably more 2018, 2019 than anything nearer term than that," he says. "Because we don't have the right content, we don't have the right price point and we don't have the right hardware. It's also going to be untethered. It's either going to be built into your headset, or it's going to be built into a phone that's connected to your headset."

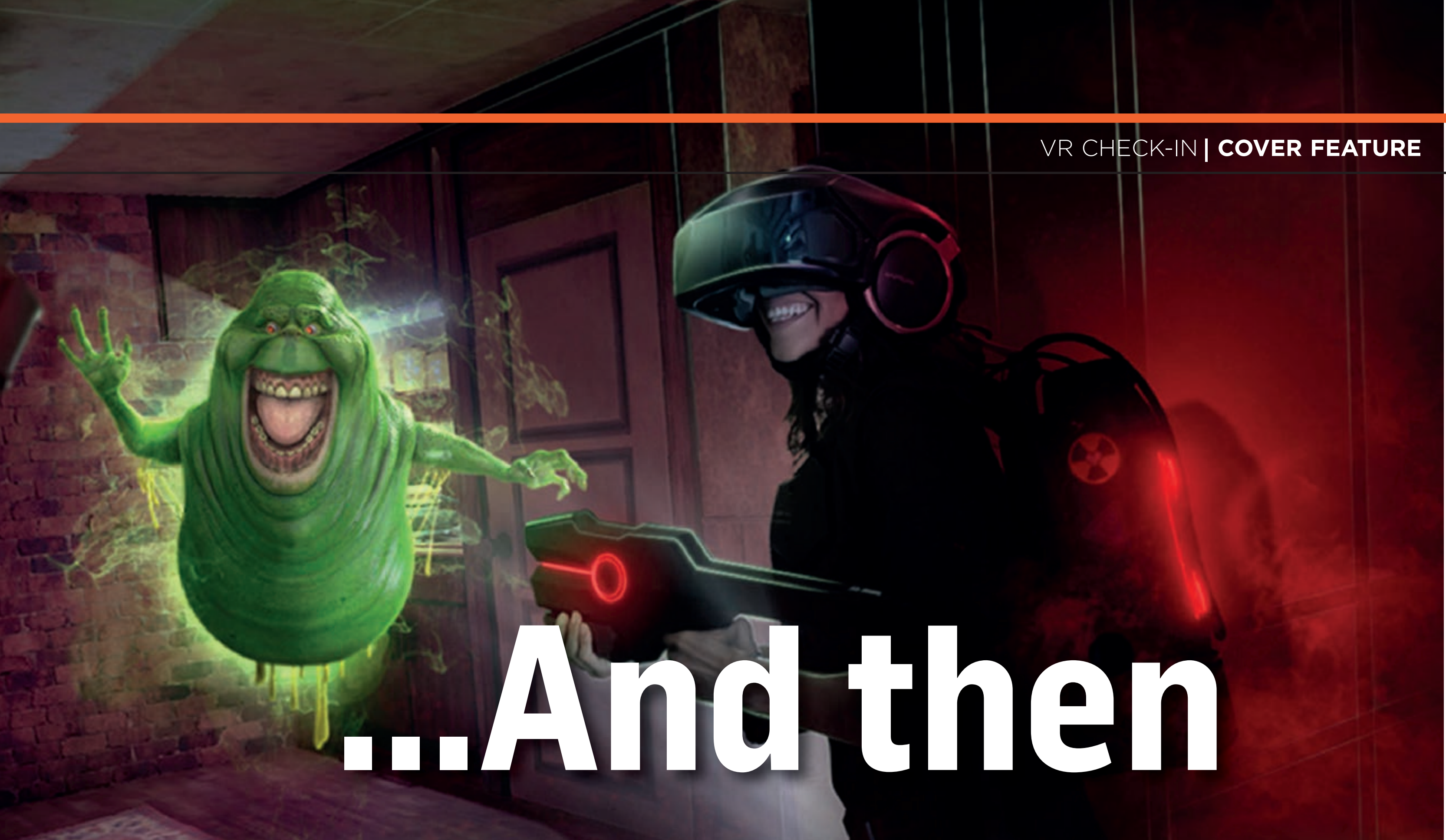
Many see price as the biggest blocker when it comes to virtual reality hitting the mainstream. Mobile VR could be the first to hit properly, since the expensive part is your phone, and everyone already owns one of those. Samsung Gear VR is already doing well, with over five million headsets out in the wild.

"I think we'll see mobile VR steadily improving," says Chris Payne of Welsh developer Quantum Soup. "There are several untethered dedicated VR systems coming along like PicoVR, which will create a middle ground in the sector, and gradually the cost of the higher quality experience will come down. 360 video seems to be popular, but I think the novelty of that quickly wears off. It's the interactive element that makes good VR good."

For Epic's CEO Tim Sweeney, it's the tech industry building bespoke components that will really allow VR to evolve. "New generations of hardware will be released which will greatly improve the quality," he says. "By quality I mean not only graphics quality, but also tracking quality and input quality and convenience. Weight and form factor. We're in the very early days of this. Keep in mind not a single component in these headsets was custom built for VR. You have displays and cameras that were completely repurposed from the smartphone industry, but when custom components are built for VR, they're going to greatly improve the whole product. We'll get 4K, and then 4K per eye. There's an industry roadmap in place that will make this world changing in a couple of generations."

Unfortunately, the tech industry can't invent extra space in your house, but there is a solution for those of us who aren't willing or able to dedicate a room to virtual reality.

The out-of-home market for VR is still in its infancy, but is growing rapidly, and is a potentially lucrative sector for developers. These bespoke experiences are going to be popping up in cities worldwide, and they're



...And then

going to need people to make content for them.

OptiTrack is a company that's betting on the out-of-home VR market in a big way. It creates technology to allow fully immersive experiences in spaces up to 30x30 meters, with multiple players playing cooperatively or competitively. An example of this is The Void in New York, which has a co-op *Ghostbusters* game using OptiTrack's tech.

Brian Nilles, business development manager at OptiTrack, has seen great growth in the short time the company has been trading. "In 2016 the number of systems that we sold into out-of-home VR was staggering, and it's happening again in 2017. We now have a system that solves all of the problems for out-of-home viability." These problems included having to create slightly different props so that they could be tracked as individual entities, but the company's new tech allows for identical objects to be tracked separately.

"Also the cameras are 40% cheaper, so all of a sudden stage costs are down and it's got a lot easier to maintain and staff. Based on that I expect to see 2-3 times the sales this year compared to last year for out-of-home VR. There needs to be quality game content behind that."

This is a market that's only a year old and has some incredible potential when it comes to storytelling, team-based co-op and both social play and socialising in general.

"The Void is spectacular," says Riccitiello. "It's built in Unity, which we're very proud of, and I think we're going to see hundreds of these dedicated locations for entertainment. Imagine a room four times this big. Here is the bar and there are six different experiences that are available around the room. I would definitely go. Imagine, In 1000 square feet you could have have DisneyLand. All of it."

It's a compelling concept, especially for those nostalgic for the arcades of the 80s. By offering players something they can't get at home (expensive tech and the space to enjoy it), you're expanding the potential market of VR gamers tremendously. But even better, there's already modern precedence for this being a success. In London we see new escape rooms pop up every month. These are physical, real-world experiences where teams are locked into a themed room and given a set time to solve a series of puzzles, allowing them to escape.

What VR offers on top of that is not only an improved experience from a production value perspective, but also the potential for different types of gameplay and storytelling.

Rebellion's lead designer on *Battlezone VR* is another developer excited by this potential. "Speaking as someone who was raised by an *Asteroids* machine, I'm all for the resurgence of out of home arcades," he says. "I think this is where room scale VR and 'Mixed Reality' can really deliver. I'd love to design something like that and I think room escape games are a good indicator of the demand for social gaming experiences beyond paintball and go-karting.

"I reckon the first outfit that delivers a VR/MR MMORPG with character persistence and quality coffee on hand is going to do good business.

"Room scale multiplayer games with full body avatars should get us close to *finally* getting a damned holodeck, so I'd be surprised if that isn't an approach taken by those looking seriously at out-of-home VR."

> **There's a roadmap in place that will make VR world changing in a couple of generations**
> *Tim Sweeney, Epic CEO*

Tom Sandford, a freelance developer, has dreams of these experiences being as ubiquitous as a family night out. "I have a warm vision of a future where a family would go out to the VR Arcade together and spend an evening together doing a virtual dungeon crawl, in the same way as we might go out for an evening of bowling now," he says.

Meanwhile Linden Lab, famous for *Second Life*, is working on *Sansar*, a social platform that allows users to create and share their own VR experiences. The CEO, Ebbe Altberg explains that his time with *Second Life* has shown him that users take advantage of the service's customisable virtual space for anything between fantasy role playing to holding business meetings. This has informed the development of *Sansar* as he sees this extrapolating to VR in a very logical way.

"We see a future where more and more of us are going to want to own our own VR experiences," Altberg says. "Whether for business use, education, for friends and family. We are trying to democratise the creation of VR content."

Sansar is currently in closed alpha, and Linden Lab is seeing some tremendous creativity already.

"Some are fun little games, some are incredible artistic expression," Altberg explains. "A huge variety. In *Sansar* we have beautiful photogrammetry of an Egyptian tomb that doesn't have public access in the real world and you can meet people inside. And the natural way you can have social interaction in VR makes it a candidate for replacing human interaction. Clubs, pubs, parks, schools can be replicated virtually. You can go anywhere, do anything."

Between new storytelling media, methods of social interaction, higher fidelity home VR technology and all-new outdoor experiences, VR fans have a lot to look forward to. And VR developers will have plenty to keep them busy in the coming years. ■

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SAVE AND CONTINUE

Why are a group of industry experts trying to digitise the very history of video games? Frank Cifaldi, founder of The Video Game History Foundation, details a wildly ambitious project to **Will Freeman**

Frank Cifaldi, much like many video games professionals, has a past life as a collector of cartridges and disks.

But for the Digital Eclipse head of restoration, games developer, former journalist and editor, the notion of gathering and preserving games has grown into something more ambitious than a personal thirst to pack shelves at home with rarities and curios.

He now stands as the founder and director of The Video Game History Foundation. The group is a non-profit formed by Cifaldi and several other industry veterans with an ambitious aim. To catalogue, digitise and preserve the history of video games. We caught up with Cifaldi to better understand the aims of the project, and why developers themselves should care.

How long has preserving video games been part of your life? Would you consider yourself a collector as an individual?

I've really not collected games, per se, since something like 2003. Really my interest has always been in the digitising and preserving aspect of video games. My roots in preservation go back to the late nineties and early 2000s, when I was involving myself in what's known as ROM dumping; tracking down what was – for me, anyway – cartridge games, and making sure they were preserved and downloadable.

And is there a natural evolution from that start to where you find yourself now, as founder and director of The Video Game History Foundation?

Yes. I guess so. I mean, it has been a 17-year 'natural evolution'. I've never had the patience for doing work that doesn't have impact, and so in my ROM dumping days I pretty quickly tried to focus on what would have the biggest impact, so thinking about what was the best use of my time. For a while I was focussing on obscure import stuff, like the Taiwanese games and Korean games. But then I started switching focus to the games that didn't ship, my thought process being that those are the most volatile, and in the most danger of actually disappearing if nobody went and grab them.

So I founded a website in 2003 called Lost Levels which, as far as I know, was the first website dedicated in any form to games that never shipped. What I did there was try and track down the people who worked on these games so I could talk to them and get their story. Try and contextualise those games. I've always really respected the efforts of these people who track down these games and then put them on the internet, but I never liked the idea of releasing a ROM and it living in a vacuum, as opposed to having context around it.

Fast forwarding to your establishing of The Video Game Foundation, how ambitious is this project? How far does preserving the history of video games go?

I am infinitely ambitious, but I'm also a realist. I'm the CEO of this company, which is a company that needs to grow and sustain and feed me, and any future employees.

So I'm scaling our efforts based on the resources we have. In terms of what kind of subject matter we would consider viable, I think that's basically infinite.

But in terms of what our day-to-day actual activities are, that's fairly limited for now. So our days here are about establishing this notion of there being a digital library of video game things, and defining what that means, and building that structure, whilst also having some of that material accessible now.

I don't want to get into this infinite feedback loop of constantly trying to perfect something that people can't actually access. Our interim solution is to siphon off curated digital collections from our larger archive, and make them accessible. I'd like to get to the point where people can curate digital collections, and submit them, in the same way that a collector might donate their collection of a specific type to an archive.

But as an example of how far we might reach, or what our limits are – which I haven't defined yet – there was someone who came to us who worked on a documentary about the *Clue* VHS board game.

This is not a video game, but a board game where you'd run the VHS and play along with that. It's kind of a stretch to call that a video game, but really it fits the story of what we're trying to do.

Right now a lot of the work is going through my backlog and sourcing material that is at the extreme end of the rarity scale, that can be digitised.

Does that logic go beyond games themselves and into related materials?

Well, for example, our next major collection is electronic media assets, so things that were sent to the press. Those were often just handed to journalists. I guess its mostly thumb drives and FTP sites now, but we have a collection going back to about 1996 on ZIP disk and CDR.

I think the material on these disks in some cases might only exist on these disks now. For example, one of the things I was playing with today was a disk of assets for *Pandemonium* by Crystal Dynamics. On this ZIP disk is a high-res version of the logo, and some hi-res renders from the cut-scene, from before they got shrunk down for the PlayStation.

There's wireframes and concept art and all sorts, and I wonder if Crystal Dynamics even has that stuff anymore, and even if any journalists have the stuff. That is an example of the easier to-do, high-impact stuff that we are focusing on right now. So we're not really looking at stuff you can get on eBay or anything like that.

In terms of access, who is the Video Game History Foundation library for?

I think if you're an archivist, thinking about whom it's for slows you down. You can see why I'd say that?

Because your focus is on preservation, and not who you are preserving this for?

Yes. But that said, I think inherently we do think about that. I am so bored by talking about older video games from a place of nostalgia.

Nostalgia is unproductive at best, and harmful at worst. I think it leads to some sort of gatekeeper-y behaviour, in terms of people feeling ownership over how we talk about things, or what something should be, or what gender a Ghostbuster is allowed to be.

I'm sort of an anti-nostalgia person. So part of this is hoping that people start to talk about this content in more interesting ways than just nostalgia.

That's a personal thing, I guess. As for who this is for, it's for historians of the future, and it's for historians now. It's for people like Norman Carusoa and Jeremy Parish who make YouTube videos about specific games or subjects that they deep dive into. It's for people who write articles too.

The dream there is that somebody who is writing an article about a game or developer can go to our library – whatever that might be – and be able to discover content related to a particular subject, and get it laid out in front of them and get their narrative from that process.

And speaking as a historian myself, it's kind of miraculous how narratives start telling themselves once you've gathered a lot of things and put them in front of yourselves.

Is this something games developers can contribute to from their studio archives, for example? Are you looking for that kind of support?

Yes we are. The ultimate dream is that we can get to a place where if people have, for example, been keeping source code for years and taking it from hard drive to hard drive, then we could ingest that source code, and work with the developers on the legalities and restrictions of that, and keep it safe.

Source code is something that is very tragically missing from any online archive that any historians can access, and I think we could learn a whole lot about games by looking at what they are actually made of.

It's the equivalent of film historians being able to access shooting scripts for a movie, and being able to see the changes that were made, and even glean the artistic decisions that happened on set, and being able to take narratives from that.

I don't think we have the equivalent in games. We don't have internal documentation people can access, and it's the same for lots of source code, assets and early builds.

There's demo builds that were made for trade shows that just disappeared after the show was over. Things like that can help people tell the story of games, and I think that in this industry we've all just kind of been taught that all this stuff is top secret, and you're going to get fired if anyone sees it.

I think that's a shame. I think we're loosing our history because of that attitude. If nothing else, I hope we can affect some attitude changes as far as that stuff goes, and get that stuff accessible to the people who would benefit from it. ■

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WRITE PLACE **WRITE TIME**

The games industry is a hectic place. Sometimes it's nice to take time out to learn in a creative, diverse environment. Jem Alexander finds out how Arvon's Writing For Games course can offer just that

The Writing For Games course, run by the Arvon Foundation, can transport attendees from the sterile lights and blaring screens of an office environment to a countryside retreat awash with literary heritage. Taught by freelance games writer and narrative designer David Varela, alongside design consultant John Dennis, the course offers games writers an opportunity to hone their craft in a unique format.

"It's a five day course in a very beautiful, fairly isolated house in Shropshire which used to be John Osborne's home," Varela explains. "We tend to have three sessions a day. Morning, afternoon and evening. Usually it's taught workshops in the morning, and afternoons are generally there for you to work on your own project, which you'll be working on over the week. In those afternoons you'll also have one-to-one tutorials with me and John."

These laid-back afternoons give the house a fantastic atmosphere, as writers dot themselves around the venue getting words down on paper (or laptop). Or together in groups, discussing their work.

"It's a nurturing environment and it's experiential," adds co-tutor Dennis. "It's open ended. I'm really intrigued and quite excited about that. It's a lot more intriguing than a classroom."

"Everybody eats together," Varela says. "There's a communal cooking rota, which helps develop a real sense of conviviality. It helps writers, who are not necessarily the most sociable animals in the world, get to know each other. And then in the evenings we tend to have more informal and fun discussions. We play games, we go to the pub. We have guest speakers too."

"One of the things we're planning on doing is sitting down every evening and playing," says Dennis. "There's an abundance of brilliant, brilliant story games. I've got a few examples that I'd like us to look at because they have moments that people remember."

Dennis lists a few games, including the original *BioShock* and *Life is Strange* as being of particular import. "It'll be a nice opportunity for some of those writers to play some games and get an idea of the state of the art," he says. "The opportunities. Different ways writing is used in games. The power it can bring."

"So, evenings a bit more sociable," Varela explains. "And on the final evening we all get together, share our work and get through a couple bottles of wine each."

This is the fourth time since 2011 that the Writing For Games course has been offered by Arvon and a lot has been learnt, both by the students and by the tutors. Varela has been involved since the beginning and is looking to make this year a much more practical experience for all involved.

"I am the still point in the turning world," says Varela. "This time my co-tutor will be John Dennis, who is a producer with a long 20-year background in games. Whereas previous co-tutors were known for their writing skills, John is much more of a producer, a practical hands-on leader and organiser of game production. I think having him involved will make it a much more practical, much more cold-faced view of how writing actually works in the studio.

"This is about finding the opportunities for free expression within what's usually quite a rigid format. And that's a skill. That's an art in itself. Every restriction is also a creative inspiration. The 14 line sonnet, the three minute single, the rectangular canvas. These are all restrictions but they're all spaces for almost infinite creativity. Games are the same thing. It's as much about enjoying the creative restrictions and finding the opportunities in that. Which is something that most creative writing courses don't cover."

> **"This is about finding the opportunities for free expression within a rigid format.**
> *David Varela*

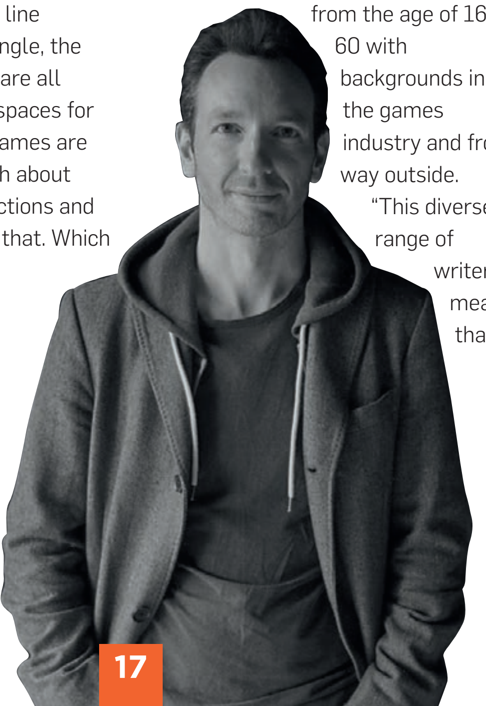
"I think the course is almost a case of good cop, bad cop," says Dennis. "David's good cop and I'm bad cop. What I hope to bring is a little bit of realism, really. The development challenges that face the developers. I very well know the benefits of working with writers. In every one of those projects a writer has brought things that we couldn't have done ourselves. But there are unique challenges of meshing gameplay and story."

"But also it's two years since we last taught this course," Varela says. "The games industry has moved on. We have constantly evolving platforms. VR being an obvious example. That's a new format that we weren't considering, certainly in 2011. There is a greater range of topics and genres of games than ever before."

This range of voices and viewpoints involved in games is something that Varela is keen to explore.

"Every time we've run the course it's been probably more broad and diverse than your average game studio," Varela says. "It's usually been a close 50/50 gender split, we've had people from the age of 16 to 60 with backgrounds in the games industry and from way outside.

"This diverse range of writers means that, because we do one-to-one tuition, we can really help people express their voices, rather than teaching a broad class where everyone is getting the same lessons, we can really help people and give them confidence in their own voice and helping them find the best ways of expressing that.



"The accessibility of game production is getting broader, so now we can have a much wider range of voices and we're reaching a much wider audience. An understanding of what makes people tick and being able to convey that in a way that is well researched and realistic and sensitive and emotionally involving, that's a writerly skill. It's something that writers have been doing for centuries. Having the tools now to have that nuance in games is relatively new."

Chella Ramanan, a student who took part in the Writing For Games course in 2014, says it has had a hugely positive impact on her career. "Thanks to the course and the ideas it gave me, I've since written and produced a radio play," Ramanan says. "Last autumn, I participated in the XX+ Games Jam in Bristol, where our game won the audience choice award. I'm currently working on finishing that narrative-led game with a team of two other women, building on ideas about storytelling that I learned at Arvon.

"The important aspect of the course is the full immersion for an entire week. I gained a much deeper understanding of what goes into writing a game and how many aspects of a game are touched by the writing. It's more than just story and dialogue. Writing for games is integral to the audio, art design and the gameplay.

"I left with friends, contacts and a new approach to writing fiction and the way I review and discuss games."

But ultimately, the Writing For Games course offers a safe space to come together and discuss the needs and challenges for narrative design in the games industry today. To learn from each other and to collaborate in a supportive environment.

"It can be hard when you're presented with a blank piece of paper, making that first mark," Dennis says. "There's a fear in the act of creation. A risk. I like that idea of 'here's a bubble away from the real world. There's no fear here'. It's about taking that fear away and allowing people to make that first mark without judgement."■

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> *I think it's really important for developers to get together at events like Develop, share war stories and learn from one another.*
>
> *Robin Hunicke, Co-founder, Funomena*

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HEARD ABOUT

THE MUSIC OF DEFORMERS

John Broomhall talks with multi-award winning composer Austin Wintory about his latest videogame music excursion

With eminent music scores for titles like *Journey*, *The Banner Saga* and *Assassins Creed: Syndicate* behind him, Austin Wintory has rapidly become known as a respected and serious player in the world of video game music. But *Deformers* sees him go ever so slightly bonkers with musical hijinks for an online multiplayer brawler in the grand tradition of *Super Smash Bros* and *Rocket League*. "It's pure mayhem and incredibly fun. The music's there to inject an enormous amount of energy into the gameplay, but also create this 'epic and whimsical' vocabulary (quoting our fantastic director, Andrea Pessino) - grand in scope, but in an ironic way, given the characters are little blobs smashing into each other!

"Style-wise, my first thought was a tongue-in-cheek tip-of-the-hat to Morricone's legendary 'spaghetti' western scores - but in a clearly silly way. From there it evolved to encompass some turbocharged Flamenco-esque music and devilish circus waltzes."

The fact the gameplay is so predictable in structure with no narrative to speak of was a departure for Wintory, more accustomed to story-driven material - though he still had to have music respond to gameplay: "Crafting an arc around a narrative which is purely implied was foreign to me but immensely enjoyable. There is also an 'interactive' aspect, though it's relatively simple - the music has an awareness of many different changing situations that the player deals with during rounds and can react accordingly whilst never looping."

Live recording involved a large cast of specialised soloists including classical accordionist Ksenija Sidorova. "I'd become a fan of Ksenija after discovering performances on YouTube, so I just cold-called her. To my absolute thrill, she jumped right in. The score prominently features two additional stellar classical performers with whom I have a long history - violinist Sandy Cameron (star of my *Assassins Creed: Syndicate* score) and guitarist Scott Tennant with whom I've worked on some films, including the upcoming *The Rendezvous*. Other soloists include soprano Holly Sedillos, Kristin Naigus (on this she played penny whistle and recorder but was previously the featured oboist on my score to *Abzu*), Ross Garren on harmonica and guitarist Tom Strahle. Tom is probably the musician I work most with, because he plays so many thousands of different instruments; in this game he plays various guitars, banjo, dobro and even electric sitar!

"We also recorded a brass session, almost like a military brass band, in London, and a string orchestra in Macedonia. The same fabulous orchestra I've worked on with on games like *Journey* and the upcoming *Tooth And Tail*."

Wintory collaborated with the dev team on integration: "Ready At Dawn has a wonderful internal audio guru, Eric Cappello, who did the final polish on implementation. We worked closely to really tighten everything. It's also key that music and sound design live very naturally together - especially in this case because both are so constantly frenetic and crazy - I'm thrilled with the results."

So how long did the music creation take? "The score isn't gargantuan in scope, in terms of run-time. I'd say 45 minutes all told, but with a lot of meticulous editing and manipulation to ensure it can stretch further. I was on it for well over a year, but with the final six months being the most focused stretch of work. And the thing that ultimately makes me happiest is how the featured musicians sound. It's not about what I wrote as much as how they played it. And Ksenija in particular, the one person I'd never worked with before, just shines. She's a total rock star. I can't wait for people to hear her!" ■

John Broomhall is a game audio specialist creating and directing music, sound and dialogue
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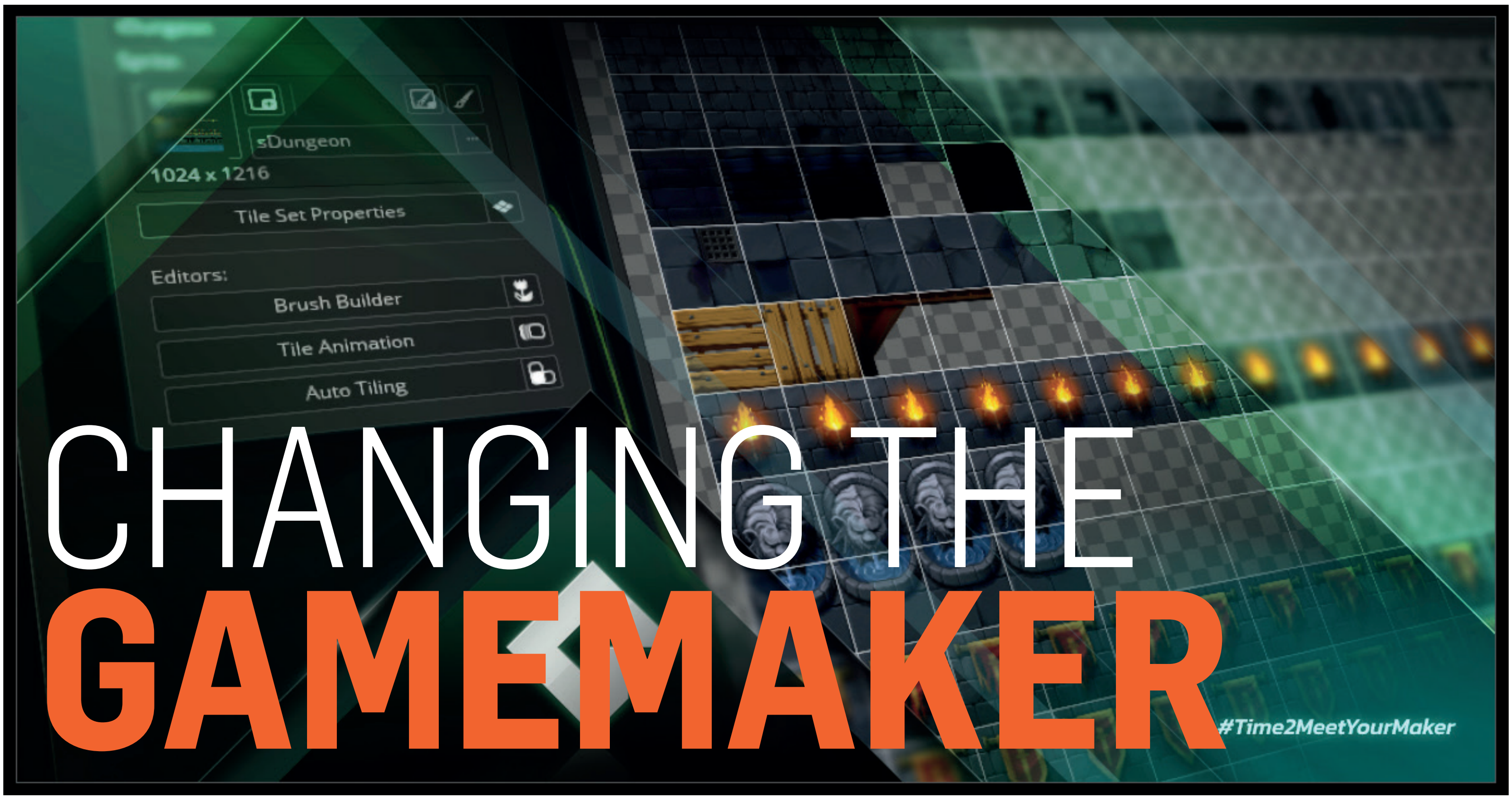
CHANGING THE GAMEMAKER



As we look forward to the upcoming release of GameMaker Studio 2, **Sean Cleaver** speaks to the team at YoYo Games about improvements to the engine and its benefits to education

YoYo Games has seen a lot of evolution in recent years. We need to go back to 1999 to find the start of this journey. At the time, Animo was released as a tool for creating 2D animations. Over time that software changed its name to GameMaker and has since gone on to great acclaim for its ease of use, accessibility for areas like education and its ability to push games to many platforms.

The list of games with critical acclaim made in the engine speak for themselves – *Hotline Miami*, *Downwell*, *Nidhogg*, *Spelunky*, *10 Second Ninja*, *Undertale*, and *Hyper Light Drifter*. The projects range from pixelated platformers to artsy point and click adventures. The engine's versatility is not in doubt.

However this has taken place over the course of 17 years and while the software has iterated into its final form, GameMaker Studio, the team at YoYo Games has now created its successor – GameMaker Studio 2.

One of the things that we've noticed is important when it comes to game engines is speed. Speed not only in the games that you create but also in getting games made and out to be iterated. GameMaker Studio 2 has been designed with speed in mind.

There's a greater focus on all-in-one creation with the addition of an in-built image editor, a simplified workflow, being able to dock windows into the same workspace and integrated tutorials. But the drag and drop setup for the engine is going to help the beginner level developer the most. The key to these improvements is simplification.

"One of the features aiming to make game development easier for beginners is our drag and drop feature," explains James Cox, general manager at YoYo Games. "This allows aspiring developers to create gameplay behaviour without having to write any code. What we've added to GMS2 is the 'live' code preview of the user's drag and drop objects, showing them how their drag and drop behaviour turns into actual code. This can really help a beginner get started on making their game, but also reassure them that they can become an expert developer over time."

"We've completely revamped the tile engine," says head of engineering, Mike Dailly, "making it much simpler to use and much, much faster. We've also allowed fast runtime manipulation and querying of them allowing simpler procedural work, and easier collision detection. On top of that we've automated the task of placing buffers around tilemap artwork allowing them to be rendered without the "cracks" that are

common in many engines.”

One of the barriers to entry for developers, from students just starting out to indies looking to get their game on digital shelves, is the time commitment required to understand repetition and processes. GameMaker’s changes try to eliminate those barriers, as Russell Kay, CTO of YoYo Games explains.

“We have taken the pain away from tedious packaging and administrative tasks when creating games ready to be uploaded to stores. Tasks that should be automated (and most professional developers will already do this, but it has been hand crafted at each studio and incrementally added to over the years). Out of the box we automate most of these so that immediately out of the gate the development process has been smoothed out and you don’t need to think about these parts.”

GameMaker Studio has been used in education for a while now and while the newest iteration is getting the full support of YoYo Games, they understand that the process of schools upgrading software can be slow. “GMS2 is designed to utilise many widely recognised game engine features, with an easy way for users to organise their projects based around these features,” says Cox. “This works well for our general consumers, but it also applies very nicely to education.

“On top of this we provide free tutorials and demos, which teachers can integrate into their coursework. With our new low price education offering being announced in April, this gives a nicely rounded game engine and tools package to teach game development. All of which any school or college can test out for free with our trial version. We like the ‘try before you buy’ philosophy.”

The engine now has extra features that can allow students to see in real-time what their actions are doing to the code of a game. While the easiest entry point is still drag and drop, the code review window will show you exactly what’s happening to the game.

> **The new Integrated Development Environment makes GMS2 even more accessible and even more powerful**
>
> *James Cox, YoYo Games*

“The new live preview system lets you view the script code that is generated from the drag and drop feature dynamically,” says Dailly, “so as you move things around the script will update in real-time showing a user exactly what they’re making, and allowing them to play with more complex coding and seeing the resulting script at once.”

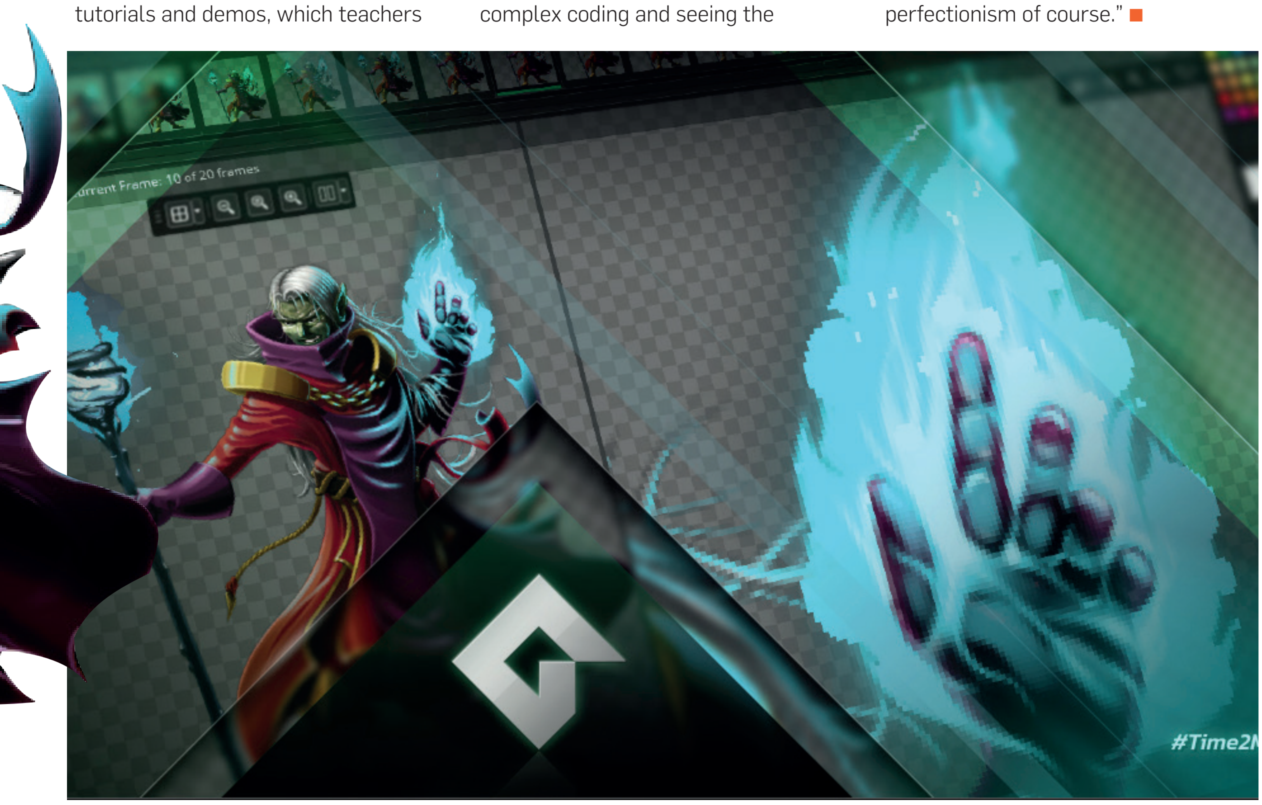
“We have spent considerable time making it cleaner, more accessible and more appealing to education,” explains head of production, Stuart Poole. “This allows students to see what their game is doing in code and when they feel confident enough they can switch from drag and drop over to coding.

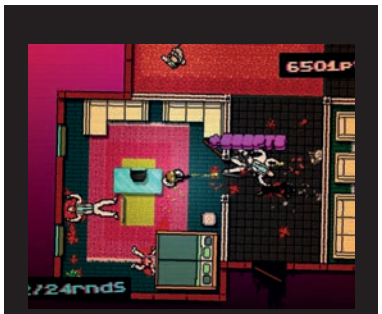
One of the biggest changes to GameMaker Studio 2 is the complete rewrite of the engine’s Integrated Development Environment.

“The new IDE makes GMS2 even more accessible and even more powerful,” says Cox. “That’s not just marketing chaff either, the total rewrite of the IDE has made workflows faster and the tool more enjoyable to use. It has also allowed us to create a Mac version of the IDE, which is gathering lots of interest. Plus, adding new features and platforms to GMS2 is now even easier to do, so expect more to arrive this year and next.”

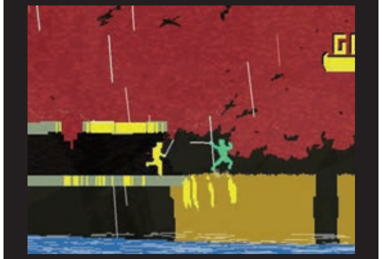
“The new IDE is looking great,” adds Poole. “The workflow has been massively improved and we have new features in GameMaker Studio 2 that optimize development time, allowing developers to focus on iteration and make successful games rather than dealing with technical headaches.”

“The faster workflow, and the more powerful layering and tile systems should mean games are just simpler to make,” Dailly concludes. “And get to market quicker – ignoring Indie perfectionism of course.” ■

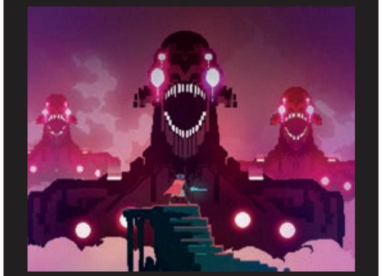




HOTLINE MIAMI
The two-man team of Dennaton Games created this surreal, ultra violent and super challenging top down shooter that takes many cues from popular culture. Since its 2012 release, it’s been highly acclaimed for its style, gameplay and soundtrack, and has spawned a 2015 sequel.



NIDHOGG
Developed by Mark “Messhof” Essen, this two player game of sword duelling won both an Indicade and Independent Games Festival award before its 2014 release. The game is now a staple for local multiplayer gamers and garnered much traction for streamers. A sequel is planned for later this year.



HYPER LIGHT DRIFTER
Echoing games like *The Legend of Zelda: A Link to the Past* and *Diablo*, *Hyper Light Drifter* tells the story of Heart Machine’s Alex Preston as a metaphor for his own health and his experience of having congenital heart disease. Since its 2016 release it’s won critical acclaim and an Independent Games Festival award.

AN **UNREAL MILESTONE**

They have twenty years of experience with their own tech. Now, to raise the game, Milestone are trying something with a new engine and a different style, as **Sean Cleaver** finds out

When I found out that Milestone had been developing games for over twenty years, I was pleasantly surprised. The Milan based studio has been specialising in the racing genre for most of that time and have kept overheads down with a smaller team, in-house software and reliable formula licences such as *WRC*, *MXGP*, *Superbikes* and *MotoGP*.

Last month the studio unveiled its new IP, *Gravel*. The more arcade based open world racing game was something that the studio always wanted to do but with the limitations in its own software and size, was unable to achieve. A new partnership with Epic's Unreal engine 4 however has seen the years of experience find their creative home. I spoke to Irvin Zonca, head of game design at Milestone, to find out more about their new engine partnership and how Milestone are also helping Unreal with a genre they aren't the most familiar with.

“I'll start by saying UE4 is a really amazing engine,” says Zonca. “Both for what it can do for graphics point of view, like lighting [and] the way it handles the graphics but also for the tools it provides for the developers. The team at Epic Games keeps updating the engine. So it's very good as you constantly get new features, new tools, new parts of the engine, and it's great.

“The better part, as a game designer, is that Unreal lets us unleash our creativity with the game designs. With our older tech that was custom made, in house, we were very limited in some things. For example, we couldn't afford to create open maps or open environments. It was impossible for us. It was impossible to apply different time of day to the games, dynamic weather was not so good and we had a lot of limits while designing the game. With Unreal the good thing is that we can really push our creativity, our brainstorming because with the Unreal Engine you could almost do everything that you're capable of thinking of.”

> **When you are given total creativity, that is when the hard work comes**
>
> *Irvin Zonca, head of game design, Milestone*

OPENING UP

The open world is something that Milestone is eager to explore with their *Gravel*, The past few years has seen a lot of racing games yet only a few have taken the open world approach like *Need for Speed*, *The Crew* and the now hugely successful *Forza Horizon* series. With *Gravel*, the Milestone team really do feel that the new found creative freedom with Unreal Engine 4 has been great for the studio.

“We had a couple of months where all the people, all the staff had to restart learning all the tools and the way the game engine was meant to be used,” explains Zonca.

“We never created an open map, an open environment. So we knew we were about to face different challenges but the challenges were more than we expected because our open maps are 35km square big. They are very, very big. The problem here is that when you start creating an open map [or] environment is that it's not like creating a specific track, because the player can really go wherever they want. So where you create a realistic track you have control, because you know the player can only do 15 corners. Then there, everything is given to the player, they have the total freedom of what they want.

“So we started understanding that the way we were building some parts of the tracks was not good because they had too many trees so the player got stuck in to them. Then we realised that some of the trees needed to be deformable [and] destructible, to avoid stopping the flow of the gameplay. We started to understand that when you are given total creativity, [that] is when the hard work comes.

“When you close ten designers in to a meeting room for a day, the brainstorming is huge. ‘Now I can do everything and I will do everything!’ but you have to face the problem of costs, of development time and also the problem that you would like to do a new experience and

experiences as a game designer but you have to train yourself for tackling these new experiences. We knew how to make a *MotoGP* circuit or an *MXGP* [track] but we didn't know how to make an open map."

INTO THE WILD

The team at Milestone, buoyed on by the power of their new engine meant that they could really start taking charge of their creative process in creating an open world map. "The way we worked was starting from real locations that we really liked, since starting totally from scratch you don't have references," Zonca says. "I can talk about Alaska, because one of our developers went to Alaska and came back with a lot of pictures. So we started wanting a place in Alaska, we wanted, in the same map, lakes, rivers and seaside. We found it in a corner of Alaska so we decided to use a tool called World Machine in order capture the real GPS data of that part of Alaska. That specific part wasn't perfect for a video game, the hills were too spiked or [there were] too many trees.

"So we put all the GPS data into UE4 and we started smoothening edges removing or adding trees and so on and now we have a very nice open map of Alaska that is really, you really feel that it's outstanding because it comes from a real part of the world and then you work on it to make it more playable.

"You are sure you'll arrive at some authentic gameplay and authentic style with the graphics and something that is playable and has a good flow. It was like reverse engineering starting from the real world. Why do we have to invent what nature already made and did better?"

LEARNING SOMETHING NEW

The development for *Gravel* is not only a learning experience for Milestone, but also for Epic. Unreal (with a few exceptions) hasn't been a racing game engine, and so whilst there is a lot of help going towards Milestone's transition to the engine, there is just as much information going back to Unreal. "The biggest limit for us with UE4 was physics and AI," Zonca tells me. "UE is a great engine, it's quite capable of doing everything but the problem is that it wasn't used so much for racing games.

"We are the first developer using UE4 for a big release on platforms like PS4, Xbox One, PC and Steam so we are the first making this extensive use of UE4 for a racing game. Problem with the physics was that we just had a very basic physics in to the UE.

"We have quite a big R&D department that's been working on the unreal engine for a year and a half now, fully customising it for our needs. We had to make our physics tool with PhysX (NVidia) that is featured in the UE and the same was done for the AI. UE is very good for shooters or for graphic adventures but the AI in a shooter is quite different. Because the AI in a racing game needs to know how to overtake, how to defend and everything is done at 180mph. It's a good partnership because we're trying to help each other to have better games but also to have new parts of the engine."

The studio is also developing their latest instalment of the *MXGP* franchise in Unreal engine 4 as well, and this comfort zone of a known development quantity and a new engine really helped the team get to grips with the tools for *Gravel* and the future. "It was a good way to start, because we felt like we really could do everything that we ever wanted to do," Zonca says. "*Gravel* was a new challenge, it's never been scary. What we are doing at Milestone is very tough because we are working on similar projects with a new engine with a team that we are training as we're using the engine. But UE4 brought to the studio so [much] happiness and confidence because the team knows it can now put its talent on a game. We have some very talented staff that was limited by our old engine, and now the UE engine is available they can try and try and try again and push the boundaries and create beautiful scenes." ■

Welcome to ELK CREEK

CULTURE? SHOCK!

The National Videogame Arcade's Iain Simons talks about why the divide between video games and art culture might be smaller than everyone thinks

For over a decade I've been writing, talking and creating events that address games as a vital part of culture. I do this because they are. I mean, of course they are, right? Let's not get into that again.

It's been an interesting, challenging road. Back in 2005 I pitched New Statesman the idea that they might cover video games with a story about EA's *The Godfather* game. To everyone's surprise, Rosie Millard (then arts editor, now chair of Hull – City of Culture) commissioned a string of features from me, which grew into regular reviews and editorials.

There was a time when the video game establishment was desperate to be seen as culture. Back when one of the first UK game culture events was staged in Edinburgh at the same as the arts festival, because, you know, culture rubs off. Shortly afterwards, that event was renamed as an 'Interactive Entertainment' festival, because 'games' was too trivial a collective noun to really communicate just how cultural they are.

Last year at the National Videogame Arcade, we staged a conference called Continu' (we're running low on game-related puns) which sought to bring together the games establishment with the arts establishment. Given what I just wrote, I recognise the hypocrisy in that, so let me be clearer - it was about bringing together games 'people' with arts 'people'. No, hang on, it was about bringing people who self-identify as being mostly game developers together with folks who self-identify as being mostly part of an arts world... Okay, look, it's an awkward fumble, but we need to allow ourselves a little slack. Of course there's lots of crossover, but just because we know that the current labels don't stretch far enough yet, it doesn't mean we don't need to use them to kick off some discussion.

Continue was trying to be pragmatic, helpful and consequential. It started when we were approached by Arts Council England with a question around how they might develop their funding and commissioning policy for video games. They were recognising that it wasn't enough anymore to just try and shoehorn games into the new-media funding policy, they were demanding of something more distinct. I've seen it too, recurring conversations with other festival directors, other gallery curators asking about how to 'do' games. Increasingly, they can see that there's a vital place for games to occupy in their world.

There was a period when the main function of games in the cultural establishment was 'only' as a marketing tool for cultural product. Promotional embedded flash games, using video games as a tool for selling some other thing. Folks like Blast Theory and the sorely missed Hide & Seek started to rebalance that relationship, making pioneering work that demonstrated just how much games had to offer the 'rest' of the world, but there's still a way to travel. At the conference we spent a full two days with the Arts Council, the BBC, V&A, Wellcome and lots of others, and at the close of it one thing was clear. There wasn't some terrible gaping chasm of understanding between games and culture, it's mostly that the people involved just drink in different bars. Their paths simply don't usually cross.

> **"It's an open door, but gaming needs to break the loop of justifying itself as art**
> *Iain Simons, National Videogame Arcade*

The burden for understanding was definitely starting to shift though, a recognition that the literacy deficit wasn't lying with the games establishment anymore. Games already 'speak' culture. The culture people need to learn to speak games.

There's opportunity. As cultural commissioners awaken to the promise of games, they're currently left with no clear pathway to understanding how to engage with their makers. Commissioners know where to go for their public art, their original theatre, their dance - but they're struggling with video games. Bridges are being built. Ukie, TIGA, the newly announced BGI and even our own humble National Videogame Foundation are all trying to help nurture those relationships, but let's do more.

It's an open door, but the gaming establishment needs to break out of the feedback loop of continually justifying itself as art. As the esteemed Jon Jordan once commented to me, "games need more cultural confidence". It's a phrase that's always stuck. Culture isn't a noun, it's a verb. Do it. ■

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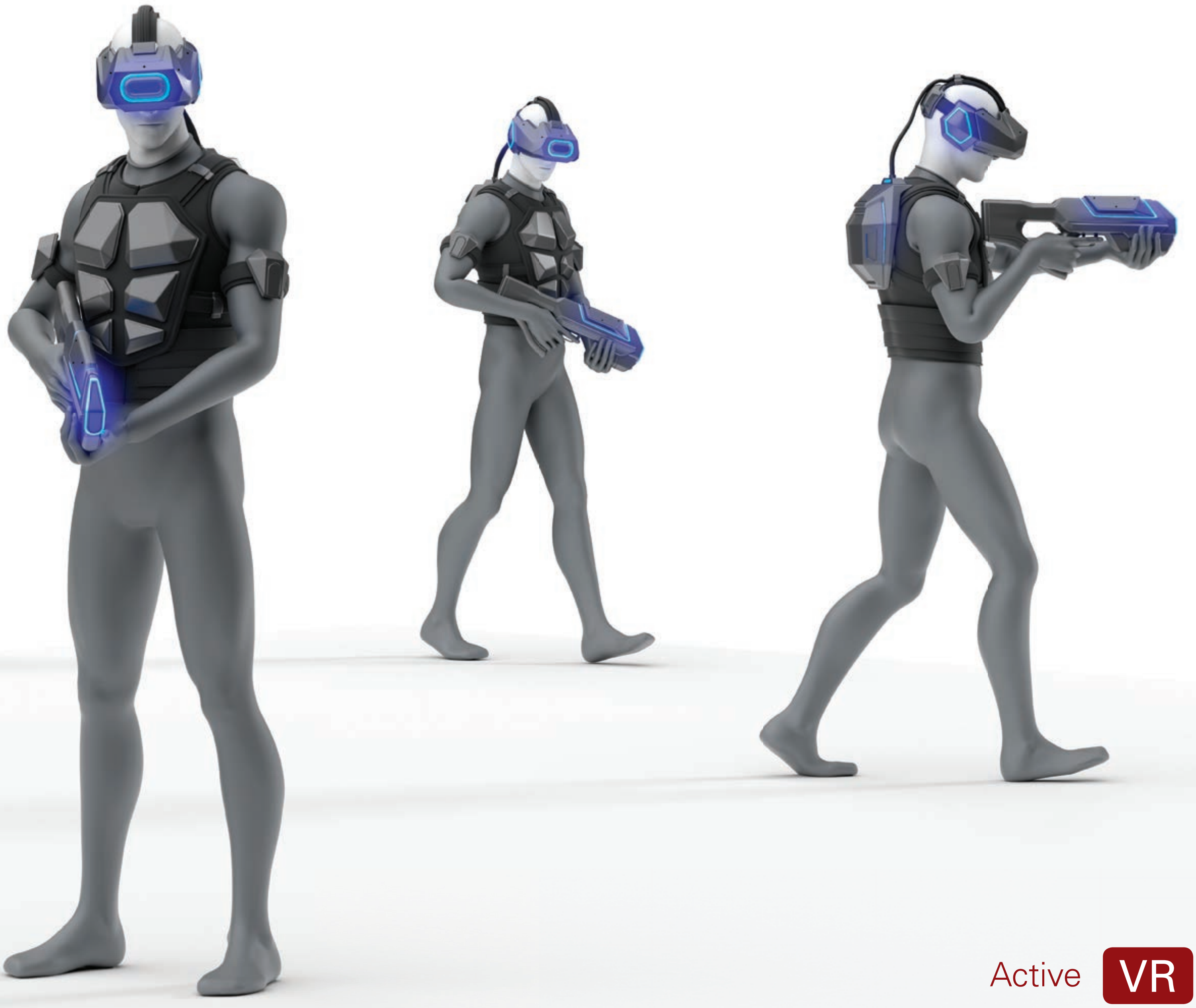

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DIMENSIONAL AUDIO

Sean Cleaver speaks to Auro Technologies' Iwan De Kuijper about their 3D audio technology and it's use in The Farm 51's Get Even

Reality is a fickle concept in The Farm 51's upcoming title, *Get Even*, which uses sound to distract or disorientate players from what they consider is reality within its world.

You've possibly seen some of the promotional material for *Get Even* and the work that's gone in behind the scenes by composer Olivier Derivière in creating the dysfunctional 3D audio for the game.

Auro 3D is a plugin, created by Auro Technologies, that can work with anything that supports Audiokinetic's Wwise audio solution. The first experience of it in *Get Even's* demo is hearing a beat, like a human pulse. It got closer, louder, and more intense before ebbing away and sounding tangibly further away. There's another point where a piano note plays and you can exactly pinpoint where it is despite there being no piano on screen. So what is Auro 3D doing to create this?

"It's a technology that allows you to record and playback 3D Audio," explains Iwan De Kuijper, director of creative entertainment at Auro Technologies. "We work together with Wwise/Audiokinetic to integrate this 3D audio format, Auro 3D.

"So basically what the developer gets is the tools to take that original input and make sure that it outputs over a standard pair of headphones. So you will use the Auro 3D panner and you would use the Auro 3D headphone technology. So all that original information that's been used with the recording will play back over regular headphones within the Wwise system."

Thankfully this is still achieveable with standard microphones with no chage to the recording process. "You can also use additional height microphones. So [with] the Auro 3D format we have 9.1, 10.1, 11.1 and 13.1 so the 13.1 easily downmixes to 7.1 and the 11.1 easily downmixes to 5.1." One thing is for certain, we've come a long way since binaural.

"In terms of that we can take this higher information, this higher virtual speaker configuration and we can easily downmix that to binaural headphone technology," adds De Kujiper. "So that's basically what you're going to here. You'll hear Auro 13.1 in a binaural stream to stereo headphones – any headphones. That's the cool thing about it. Also in collaboration with Wwise/Audiokinetic, we have cross platform availability."

The spatial element does give a developer a lot of creative freedom with how they approach manipulating sound. "The good thing about the technology is that we try to make it as natural as possible," says De Kuijper. "So it's not about the extremes, it's about how you use the technology and how you implement it in the best way, making it sound as natural and immersive as possible for the experience.

"If you're a developer you can code that in. You can decide the 3D positioning of your sounds. With stereo audio you'd have that at a constant level on your left and right ears. In terms of the Auro 3D technology you can take that original sound and have that move around in the 3D image so you can make it brighter, or you can make it smaller towards your ears.

"As an example, there is a part in the game where everything becomes really narrow. So with the technology we are able to take certain elements within the game and make them come closer to your ear. So you get the feeling when you go in to a basement that things start to creep up on you."

This sound design is the work of *Get Even's* composer Derivière. "He used creative ways in order to use our 3D technology in the video game," explains De Kuijper. "When you hear it, you understand what we're doing. But there are some creative ways that we recorded the score in Auro 3D.

"You don't want a full-blown orchestra floating around in a 3D environment. That will become unnatural. There are parts in the game where you can actually use it. The way you code [sounds] in to the engine [can] decide how much 3D you want to use. Anything that can use Wwise can also use Auro 3D as its fully supported by the solution." ■

LUDUM DARE TURNS XV

As the industry's most famous global game jam hits an important anniversary, **Jem Alexander** talks to co-founder Mike Kasprzak to find out how we got here, and where it's heading in the future

This month marks an impressive milestone for the industry's oldest and most famous regular game jam. Ludum Dare celebrates its 15th birthday on April 21st by kicking off the 38th major jam and revitalising its web presence with a new site, ready for another 15 years of 72-hour global game dev competitions.

For those unfamiliar (all five of you), Ludum Dare asks participants to create a game within 72 hours based on a theme voted on by the community of jammers. These games are then rated by the community until one is crowned king. With thousands of games created and rated per jam, Ludum Dare has grown huge since its inception in 2002, when it was created by a group of games industry buddies.

"Ludum Dare started as this niche thing my friends and I did as a hobby," says co-founder Mike Kasprzak. "Many of us were also involved in the games industry, so as we ran more events, it became interesting to watch how Ludum Dare paralleled the industry. You could track current trends in game development tools by checking what people used for Ludum Dare. Highlights over the years include the rise and fall of Flash, the rise of middleware and the explosion of indie games."

The mention of Flash should give you an indication of just how long 15 years on the internet can be. "We actually predate popular services YouTube, Twitch and Twitter, but we started using them as part of Ludum Dare very early on," Kasprzak says. "Today, I don't know what we would be without them.

"Nowadays there's even a term for what we are: a game jam. We didn't have a term when we started. I used to call us a 'game compo', something I borrowed from the Demoscene. Even the term 'indie game' hadn't caught on yet. I think we were still calling games 'shareware' back then."

DARE TO DEVELOP

Ludum Dare's success is the industry's success, as many people who take part in the jams have used it as a way into working in game development. "Ludum Dare being successful means more people are making games," Kasprzak says. "I've been told many stories about how Ludum Dare got them into games, and I'm always thrilled to see the next big indie game to come out of the event."

> **"I'm humbled that this 'hobby' project my friends and I started means so much to so many**
>
> *Mike Kasprzak, Ludum Dare co-founder*

The growth of Ludum Dare over the years has several reasons, according to Kasprzak. There was some struggle early on, but the indie game boom gave the game jam a large boost. One famous indie developer in particular contributed to the jam's reputation in a big way. "After a rough few years in the beginning, we finally kept to a schedule," he says. "Twitter hadn't caught on yet, so consistency was one of the few things we had to keep people interested. That meant as 2008 rolled around, when indie games were finally gaining traction and mobile gaming exploded, more and more developers were looking for something to do. We broke 100 participants for the first time in April 2009.

"A couple years later, one of our regulars got some attention after he made a game called *Minecraft*. It wasn't a Ludum Dare game, but while that was gaining popularity, he continued participating in the event. Notch taking part validated the event for a lot of people, and that's when we really started to grow. To think, today 2000+ games in an event is normal."

EVOLVE OR DIE

As the community grew, the organisers needed to adapt to the influx of participants. Evolving alongside the trends of the games industry. "The event began with some very strict rules, but we tweaked and loosened them over time so more people could enter," explains Kasprzak. "I've been active as a game developer for the majority of Ludum Dare's lifespan, and I do tend to keep an eye on trends."

When a hobby gets off the ground to the extent Ludum Dare has, how does it feel to have expanded the community so greatly? "Actually that's one of the things I miss," Kasprzak says. "Back when Ludum Dare was smaller, it was easier to get to know people in the community. I could casually join our IRC channel and hang-out for hours chatting with whomever was around. But as I got busier, and the event got more popular, I had to take a step back. I miss the days when there was time to casually get to know folks."

This community is a diverse one, thanks in part to the anonymous nature of the early-2000s internet, as Kasprzak explains: "Because we're primarily an internet event, we never really see race or sexuality. We don't see age either. Instead we get to judge each other based what we make, and how we present ourselves. We get to know people inside out, rather than outside in. I think there's something kind of wonderful about that.

"As a side effect, that has made us a rather transgender friendly community. It just sort of happened, and I'm glad it did. I definitely think we're better for it."

There's also a good cross-section of the games industry represented in participants of Ludum Dare. From indies to triple-A devs looking for an extra-curricular creative outlet. Hobbyists and students also get involved, as it's a great way of creating something which could lead to a job in development, or a way to learn skills through practical means. Making games is the best way to learn how to make games.

Some games made during Ludum Dare are then developed further to become full products, sold on Steam. This is becoming a more regular occurrence as the years progress and there are some games that you may have played that you'd be surprised to learn started life as a prototype during Ludum Dare.

"There's a handful of Ludum Dare games on consoles too," says Kasprzak. "I'm still waiting to hear what the first Ludum Dare game on the Nintendo Switch is going to be." Perhaps that game will be one created during the 15th anniversary jam. Who knows, maybe you'll be the one to make it, dear reader.

Game jams are becoming a huge part of indie culture, and Ludum Dare has no signs of slowing down. In fact, as part of the 15th birthday celebration Kasprzak is looking to bring the jam up to date: "We've got our brand new site launching for the 15th anniversary event on April 21st. After that, and some housekeeping, we can start looking into what Ludum Dare can do to inspire even more people.

"I've never thought of myself as an educator. Growing up, I got out of school as soon as I could. But what Ludum Dare and other game jams do feels something like it. The impact we have on so many people is mind blowing to me. I'm humbled that this 'hobby' project my friends and I started means so much to so many." ■

Ludum Dare to be digital

Here are just a few games that you've almost certainly heard of, but may not know started life as a Ludum Dare project. You can find a fully curated list of Ludum Dare games on Steam here:

http://store.steampowered.com/curator/537829-Ludum-Dare/

TITAN SOULS

Titan Souls
Originally created for Ludum Dare 28.

Theme: You only get one.

Won 1st place.

Evoland
Originally created for Ludum Dare 24.

Theme: Evolution.

Won 1st place.

PONY ISLAND
OPTIONS & HELP
CREDITS
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Pony Island
Originally created for Ludum Dare 31.

Theme: Entire Game on One Screen.

Broforce
Originally created for Ludum Dare 23.

Theme: Tiny World.

Mini Metro
Originally created for Ludum Dare 26.

Theme: Minimalism.

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What would it mean for gameplay if accessible AI tech could grant NPCs the ability to answer back unscripted? The SpiritAI team might be closer to that than you expect, as **Will Freeman** investigates

TALKING HEADS

For many years, when artificial intelligence came up in conversations about game development, people might have been talking about the likes of path-finding, navigation and combat.

But something exciting is going on that could bring the AI of science fiction into contemporary game design. NPCs could be granted the power to speak their artificial minds, and offer community managers a powerful weapon in their anti-harassment arsenal.

Making game characters communicate more convincingly might not seem directly related to seeing off unpleasant player behaviour in online worlds, but that is where the SpiritAI team excel in their craft; artificial intelligence and its ability to communicate naturally.

"Really I see our mission as making games a more engaging and also more accessible, through AI," says Mitu Khandaker-Kokoris, SpiritAI's chief creative officer and renowned game designer. "That lies at the core of both the products we have underway at the moment. And then broader than that, and at a top level, we're trying to make AI more humanistic."

Those products are Character Engine, which hopes to provide game designers and others with ways to write characters that will converse naturally and off script, and Ally, which delivers a fascinating means to face off the challenge of online abuse. Both technologies, shown at GDC this year, are certainly distinct. And they could have a profound impact on how games in the near future are played and managed.

CHARACTER BUILDING WORK

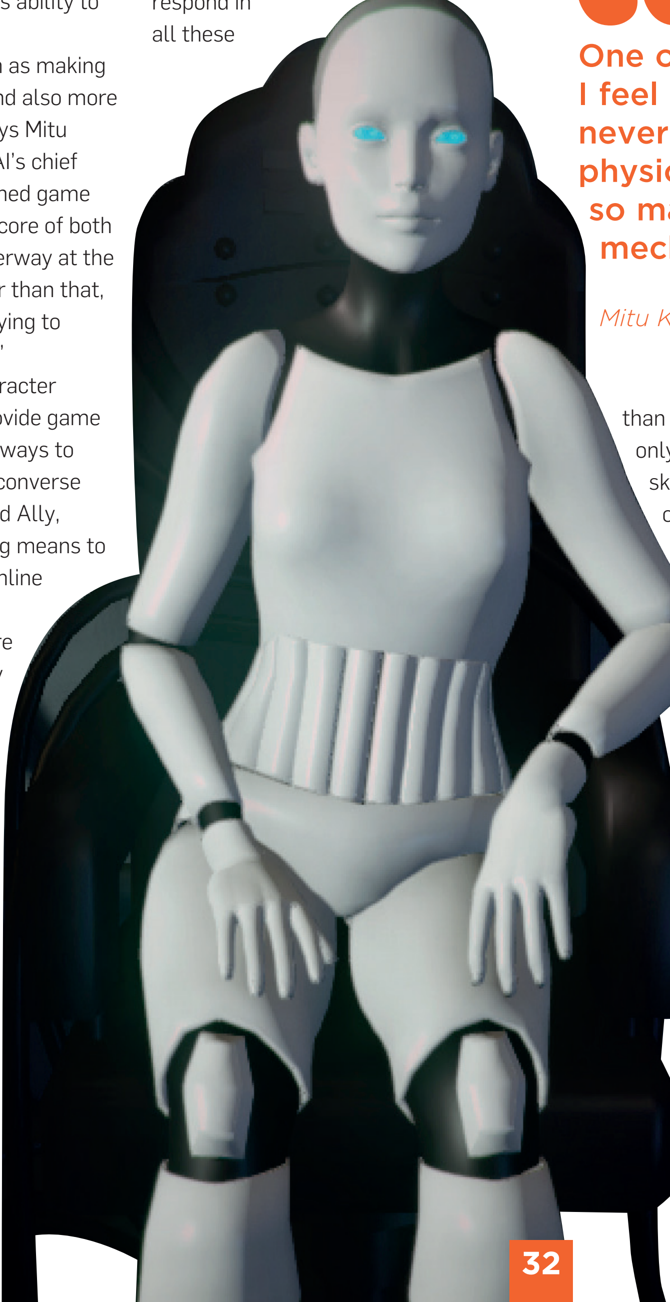
Character Engine offers a combination of an SDK and authoring tool, the latter of which lets designers and writers sketch out the personality, preferences and knowledge of NPCs and other in-game beings, which can then converse freely, and convincingly, with players via voice input, text chat, controller inputs, or other means.

As Khandaker-Kokoris fires up a demo, created in partnership with UK studio Bossa, it's immediately obvious that the technology has potential. The demo title, *Interrogation*, lets its player cross-question a robot, which sits in a dimly lit room. Using natural, typed English, questions must be asked to extract information from the robot, which replies with a spritely, generally smooth Scottish accent.

This is not just a robot that replies relevantly. Depending on the player tone and line of questioning, this is an NPC that can be helpful, direct, evasive, irritated or considerate.

"We want to let game NPCs respond in all these wonderful, dynamic ways, using AI," Khandaker-Kokoris reveals of the effort with the Character Engine. "Really the power there is game designers' ability to let the player express themselves, and have expressive input that results in expressive output. That means a system that really understands what you are saying, and having a character that can decide what to do as a result of that, where that character can even steer you in one direction."

The result are NPCs that not only know what to say, but equally know when 'she' is appropriate, or if a first name is best needed for conversational clarity. They'll certainly know exactly when they're being less than crystal clear and you'll only have your own social skills to blame when an NPC outwits you in conversation.



> **One of the things I feel games have never done is social physics. There are so many gameplay mechanics there**
>
> *Mitu Khandaker-Kokoris*

EXPRESS YOURSELF

It won't just be what players say that impacts the artificial thinking of Character Engine powered entities. "We want more than that," Khandaker-Kokoris asserts. "We want to have what players are doing and how they stand relative to NPCs influence things in the scene, whether in a traditional game environment or something like room-scale VR."

Player body language, eye-line and attention may soon be factors to consider when pulling narrative from an NPC. The impact on games could be vast.

"What this means for the player is being able to stop thinking of NPCs as these very static things that dispense set stories," Khandaker-Kokoris suggests. "This could see interesting, nuanced interactions with NPCs, and interactions that will never be the same for different players. And in this age of streaming, the lack of dynamism - or real dynamism – is strikingly apparent.

"One of the things I feel games have never really done is this idea of social physics, where players have to really think about communicating with other beings, and where or how they converse or interact – maybe using shorter sentences – will have a real impact, just as it does in real life," Khandaker-Kokoris continues. "There are so many gameplay mechanics there."

WRITING THE UNSCRIPTED

All that technology and potential, however, would mean very little if it wasn't accessible to those that shape characters and stories in game worlds. Those creatives aren't always coders, and rarely have they been expected to master the engineering of artificial intelligence. Fortunately, that consideration is a foundation stone of the development of Character Engine, and in particular its authoring tool.

"What we're really interested in doing is adding more depth to characters," Khandaker-Kokoris explains. "So this idea of 'cognitive AI' is actually giving characters motivations, their own agendas, and things they want to talk about, or want to convey to you. But we don't want to take away control from the creators and the writers. This is still a creative tool. It's not about instantly automated characters that are just released to do whatever they want.

"You still have to architect them according to your creative vision. That's why with Character Engine what we effectively sell is an SDK and an authoring tool." That tool looks similar to standard scripting software, but never demands users to write long, complex branching narratives.

"Writers can set social practices within their characters. Very specific ways in which we'd expect them to behave, or expect them not to behave," says Khandaker-Kokoris. "In the real world, for example, if I say hello to you, I'd likely expect you to say 'hello' back. If you didn't I might be a bit miffed. So game writers can set what an NPC expects from conversation, or how it responds, and play with that. You can, using our authoring tool, sketch out an example of how a character might expect a certain behaviour from players, and behave in a certain way if you don't meet their expectation of certain social practices."

So if you're writing a character that has a thing about manners, it is entirely possible to set that they find words like 'please' and 'thank you' important. But you won't have to write their every response to every possible etiquette slip-up.

"The authoring tool gathers lots of conversational snippets, using them as examples," Khandaker-Kokoris details. "So we can write questions the player might ask 'did you witness the murder?', for example. What the system will then do is automatically register that as an example of a clarifying question to do with particular keywords.

"What that means is players don't have to ask questions exactly as scripted in the examples. They ask something else around the same area, and depending on their question, they'll get some or all of the information as set out in the example. There's lots of variation in how questions and dialogue are handled, because we've been doing this natural language classification, using all the classifiers that we've trained up to recognise what a clarifying question looks like, or what a question about identity is, or how farewells typically look. That's thanks to the power of machine learning."

THE WRITE APPROACH

This isn't just a tool conceived to compliment the existing experience of writers. More than that, the wider approach deliberately echoes the way people have been shaping stories and characters for centuries. "The way you build up a personality in Character Engine is really the same way any writer would build up a character and conceive that character's personality," says Khandaker-Kokoris. "In many ways, a big part of the personality of a human is how that react and respond in any given situation. How do people respond to conversation? It's something we all think about, because it's how we present ourselves to the world. It's a big part of how people traditionally build up characters and write for them. And it's how you can approach Character Engine."

The tool offers ways to set and confirm what NPCs know, what their allegiances are, and how they relate to various entities – from individuals to entire institutions or companies. There are various ways to help writers keep track of the characters and world they are establishing.

"We've got tonnes of visualisations for writers, which we're adding," Khandaker-Kokoris enthuses. "At our GDC demo, in a room full of narrative designers, people really nerded out over it.

"And those kinds of visualisations are super useful for writers, especially if they're writing in this new way, building up who characters are and how they might react to a given situation. Whether you're a big triple-A team with a number of dedicated writers, those writers can use the authoring tool, while the programmers can integrate our SDK into their game engine.

"But if you're a one-person team or a small indie, you can use the Character Engine tool, and easily integrate it into Unity. We wanted to be as flexible as possible and as extendable as possible, and build a very accessible and engaging to use tool that lets people bring this kind of AI into their games. Hopefully that will result in accessible and engaging games."

COMMUNITY MATTERS

The internet is home to some unpleasant human behaviour. Much online abuse, its fair to say, uses language. Written or spoken, words in online communities are powerful tools for abuse.

But technology can help NPCs to respond to human players can also listen in on the conversations between real players in titles like MMOs.

Ally is the SpiritAI platform that helps monitor harassment in online communities and when it listens, it understands.

"Often big teams of moderators need to read player reports of harassment and so on," explains Mitu Khandaker-Kokoris, chief creative officer at SpiritAI. It can take a very long time, and a lot of effort. So what we offer is a multi tier solution with Ally. "Basically, what we're doing is providing a three-level system, where we can support players on a personal level, at a community wide level, and by providing predictive analysis."

That support comes in remarkable ways, where the system offering much more than keyword alerts can identify potential harassment, send NPCs to converse with the targets to see how they feel and offer action, and even understand friendships where a little course language might be natural.

"It allows us to apply different boundaries to different contexts, says Khandaker-Kokoris. "Perhaps you've got a good friend who is smack talking and using questionable language with you. Not knowing anything about that friendship might mean an ordinary automated system would simply block that person. But with a system that can converse with you, we can ask a potential victim 'are you OK?'. They might tell our AI NPC that's fine, which means our character can learn that about that human relationship, but won't let others freely abuse the person identified as maybe getting harassed."

A FRIEND OF COMMUNITY

Of course, Character Engine's close relative is a rather different beast in terms of its aims.

But Ally's community management powers pull on exactly the same ability to harness and focus social physics and cognitive AI, as detailed ing the Community Matters panel.

Currently, SpiritAI is working with several game developer partners, while working on serving other industries and creative specialties also in need of natural, meaningful conversation between human and computer. Robotics makes for an obvious market, but there's also a space for Character Engine's abilities in the worlds of training, medical care and education.

"The idea of assistance bots has become a very real idea now, and using our tech there could be very powerful," Khandaker-Kokoris offers as an example. "Now we have all these things like Alexa and Siri, which are great for short question and answer interactions, but they have no personality behind them. That's not what the future of assistance AI should be. We want – again, going back to our original mission of building much more humanistic AI – to help people building these other technologies or working in other fields to build characters that actually have personality, and actually can work according to a particular agenda."

Exactly what that means for video games is as uncertain as it is exciting. There's much talk of new game genres as Khandaker-Kokoris packs away the demo, and even a little musing on what this might mean for the role of voice acting in games.

"Bossa were keen to answer the question – as Imre Jelle [co-founder and creator-in-chief] there puts it – 'what is the walking simulator of conversations?'."

It's a striking question, as are most of those that centre around Character Engine's potential to reinvent the conventions of gameplay. ■

A YEAR IN THE LUMBERYARD

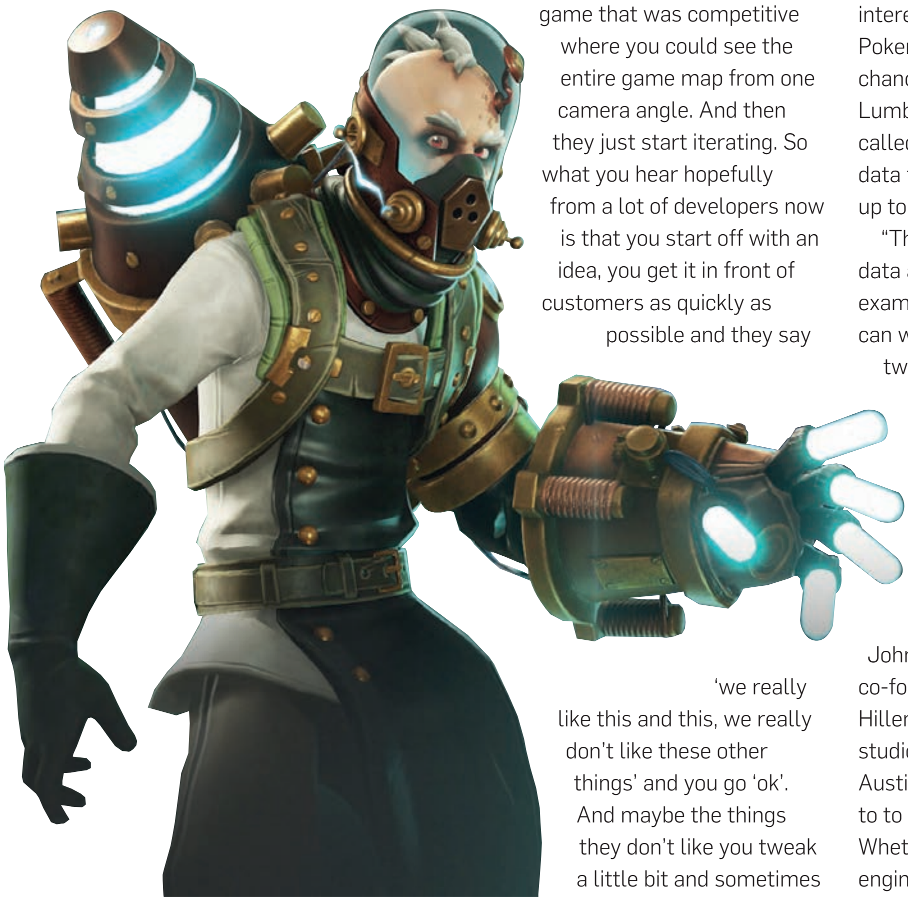
Sean Cleaver catches up with Amazon Games Services vice president, Mike Frazzini, to see how the Amazon Lumberyard engine and the company’s gaming focus has come on in the past year

It’s been a year since we last talked to Mike Frazzini about Amazon Lumberyard and we’re already beginning to see the fruits of its labour. After a solid twelve months of hires and development, there are a few games already out, including new multiplayer brawler game, *Breakaway*. One of the things he talked heavily about then was the purchase of Twitch and its integration in to the Lumberyard engine and the games Amazon are making.

“We look at twitch and are amazed by how the twitch community has changed the way games are experienced and what we think is next is for the twitch community to change the way games are made,” says Frazzini. “We start with this idea of ‘what would it mean to build a game for Twitch’, Twitch for broadcasters, for viewers and our designers said, ‘well what do you mean?’ I don’t know, you tell us what that could mean. And they came back with whiteboards full of ideas and these really interesting ways for what it would mean to build a game that was fun to watch.

“We believe in creative autonomy, so we allow the designers to say ‘hey, if you love Twitch and you’re interested in creating online multiplayer community based games,’ then from there you go what do you have in mind, what do you think you want to do.

“And so with *Breakaway* the team was very interested in creating a game that was competitive where you could see the entire game map from one camera angle. And then they just start iterating. So what you hear hopefully from a lot of developers now is that you start off with an idea, you get it in front of customers as quickly as possible and they say ‘we really like this and this, we really don’t like these other things’ and you go ‘ok’. And maybe the things they don’t like you tweak a little bit and sometimes it’s a lot more than that. *Breakaway* is our view of saying how can we make a game that has to be fun to play, obviously, but maybe we can make it when we think about it that’s also fun to watch.“



100 PER CENT OF STATISTICS

Frazzini has previously spoken to us about the use of ChatPlay and JoinIn with the Lumberyard engine. But with *Breakaway* the development team are trying a new technology in Metastream, which provides broadcasters of the game live and accurate stats of peoples in game performance, as Frazzini explains: “Whenever you’re watching a competitive sport or game, statistics are more fun. They make it more interesting. You watch World Series of Poker, this guy has this per cent chance of winning. So within Lumberyard, we created this thing called Metastream, which kicks out data from the game and serves it up to broadcasters.

“Then a broadcaster can take that data and tell stories with it. This is an example of where we say that, how can we make a game that’s built for twitch and broadcasting. The game has to be fun, if it’s not then none of that matters. But if you go from there, there’s definitely a lot you can do to amplify it.”

Amazon has moved on apace from this time last year with a string of hires including former Daybreak Studios CEO John Smedley, Westwood Studios co-founder Louis Castle and EA’s Rich Hilleman as well as opening two new studios in San Diego, California and Austin, Texas. Amazon always refers to to everyone as a ‘customer’. Whether you’re a developer using the engine, a broadcaster using the software or a player playing the game, everyone is a customer in some way shape or form. And Frazzini and his team are very much behind the idea of getting things out to customers as quickly as possible to generate feedback and encourage iteration. In fact their entire ethos has been behind three things: the creation of communities, the service to customers and the ease of iteration.

“We launched Twitch Prime last August at Twitchcon, that’s done extremely well for us,” says Frazzini. “We launched Lumberyard last February, with nine releases since launch and over 2000 fixes and feature enhancements in that time. And so the development on the team is accelerating and us getting Lumberyard out early in to a beta was totally the right thing to do, because we have customers who are coming on early and they’re getting more support from us, they’re helping to shape the roadmap and then what ends up happening is you end up in a situation where the development teams are getting rich feedback from customers. They’re not guessing what they think they should do; customers are saying ‘this is what we need.’ Ok, and then in two weeks you build it and give it to them.”

BREAKAWAY SPEED

This pace of iteration is something that Amazon has taken in part from early access for games and has started to apply it to everyone in a game development pipeline and it all sounds rather organic. “We really believe this is how games will be developed over time,” believes Frazzini. “We’re a game developer and a big part of Lumberyard is that we wanted it to be modular. We want game developers to be able to change things that they

want to change, so we give them full source and then we built this component system in it that makes it really flexible. So that if they want to build something unique for their game because they want to create unicorns that spit rainbows out of their mouths and they need a particular system that does that, they can build it and integrate it in to the engine.

"That is a goal for us we want to make it really easy for them. And the reason is, to your point, which is when you're making a game and you're listening to customers, you're going to be wrong around what you thought the game should be. Customers just go 'I don't like that' and then you go 'crap' we've got to make some changes. And so you want to have that flexibility to be able to do that in development. You can't do that utterly otherwise you'd never finish a game. But there is some degree where you have to listen to the big swings and those big opportunities to make the corrections."

EARLY DOORS

This kind of pipeline eventually ends up in the hands of players, and when it comes to releasing games early, or possibly incomplete, Frazzini tells us that the benefit of this is an oft discussed point for Amazon. "We wonder about that," Frazzini says. "We debate this internally because I play a lot of the early access games, they're a lot of fun and I'm glad that I got an opportunity to do that. And we've debated it so I don't know if I can give a good academic compare and contrast. What I can say is the idea of getting games in front of customers early and often is totally the right way to think about it.

"The question is when is the right time, how many people do we let in, how public can it be or not. If you make it super public really early, it doesn't look very good, the gameplay is probably clunky in places you didn't know about. With *Breakaway* and with all our games we said at Twitchcon, certainly what we want to do is find the nucleus of what's cool and awesome and when we do, say 'here it is, and we're just letting you know we're early and we've invited you in but we think we have enough here, we'd like you to play and tell us what you think."

CUSTOMER-CENTRIC

Amazon's thoughts though are not to compete in the space of game engines and distribution, but to be in the forefront of it for their customers and communities and to get the best team behind their products. "I think the interesting thing is in Amazon is that we're customer-centric not competitor-centric," Frazzini continues. "And if you want to be inventive and you're competitor-centric, you have to wait around for your competitor to do something. And when you're customer-centric, you don't have to do that.

"The average tenure of the team is 10.8 years now. So we have people that know how to make games [and] that have made game engines. We know how to do a lot of this stuff but the inventive stuff is the stuff that no one knows how to do because it hasn't been done yet. And for us, our focus is two fold.

> **The question is when is the right time, how many people do we let in… We'd like you to play and tell us what you think**
>
> *Mike Frazzini, vice president, Amazon Game Services*

"First of all he engine has got to be great so we take that very seriously. But then in terms of what's unique about it, the cloud is today an incredibly important part of game development and its only going to increase over time. And when you talk to game developers what they tell you is the same thing. It's really important hiring and retaining cloud engineers. It's hard.

"The second area is communities. The most successful games now are all about communities. We had a statistic - 85 per cent of revenue on PC and console is from multiplayer games. It's crazy. You look at mobile it's the same thing. You look at the top sellers – how many of them have multiplayer community based features to them? Most of them.

"Twitch is one of the biggest most vibrant places where those communities form. We brought Curse, which is a huge community platform, wildly popular gaming site, and communication channels. That's another example all about community. So we think 'ok, what are the cool things happening in these Curse communities and how do we build tools in lumberyard to help game developers to create this type of content.'

"The cool thing is if you think cloud and community, for us, that's totally the areas for extreme invention. Our render? We'd like to think it's going to be, if it's not, the best in the world. It's got to be otherwise what's the point? And our animation systems and our physics systems and things like that. So we take those things extremely seriously, but then we think 'Ok, what's the real point of frontiers that we're going to be inventing?" For us it's around the cloud and it's around communities and events." ■

ESPORTS TO EDUCATION GENDER IMBALANCE

Aardvark Swift's Joseph Relton speaks to Women in Games' Marie-Claire Isaaman about gender imbalance

Despite women currently making up around half of UK gamers, a survey published by Creative Skillset (2016) suggests that the game industries are actually the most imbalanced of all our creative industries for employing women. A study published in 2005 by IGDA suggests that only 5% of programmers and 11% of artists were women, and more recent studies haven't proven IGDA much different.

Gender balance is a complex issue with any number of factors feeding into it and no golden solution. In order to gain some clarity on the issue, I sat down with Marie-Claire Isaaman, the CEO of Women In Games, a not for profit organisation which works to recruit more women into the industry and to support those that are already there, to get her view on the current landscape of gender imbalance within the game industries, where we should be focusing our efforts, and if esports can catch up any times soon.

What do you believe are the main causes of the gender disparity gap in the games industry?

There is no single factor, rather a complex set of issues. That makes things difficult to change because there is no simplistic silver bullet solution.

Some causes are historical, some cultural and some more organizational. For example, the mainstream industry spent years targeting a 'hardcore gamer' demographic of primarily young men, with consoles and games designed and marketed heavily towards this audience in the 1990s and 2000s.

Really, it's only since the so-called 'casual revolution' of the late 2000s – i.e. the rise of mobile and other non-console platforms – that females have constituted around half of game players.

There's a cultural legacy from that 'hardcore' period that still permeates the industry, often affecting organizational cultures. It can also dominate the perception of games in wider society – resulting in games still not being taken seriously as an artistic or cultural form.

Women might now make up half the players but the last Employment Survey for Creative Media Industries by Creative Skillset suggests only 19% of workers in the game industries are female, the lowest proportion of all the UK creative industries. So the sector has remained male dominated even after its audience and realities have changed. Clearly, this cultural lag needs addressing.

There are also factors inside organizations. After Gamergate, I was commissioned to write the Gender Balance Research & Development for the Games Industry Report for NextGen Skills Academy. I identified key areas of gender disparity and provided recommendations to counter it. The main areas for improvement included Equality, Fairness and Work/Life Balance; Dignity at Work, Bullying and Harassment; Age, Seniority and Absence of Women in the Boardroom; and the amount of women who actually make games.

All of these areas need improvement to make the game industries somewhere talented girls really want to be, and to help them stay once they arrive.

Where should we be focusing our efforts to encourage more women to enter the industry?

Well it's worth remembering discrimination needs to be addressed throughout wider society and culture, it doesn't just occur in the game industries. But an area that needs particular support is the educational pipeline that serves the games sector. At school, girls often aren't sufficiently encouraged to follow careers in games or technology. At college and university level, courses are often extremely male – both in staff and students – and the curricula can also reflect that. Consequently, girls can find it difficult to express themselves fully. Also, college or university management don't always prioritise achieving gender balance in either cohorts or departments.

Another problem is that we need more research to fully understand many of these issues. Currently we don't have a clear enough picture. I'm now beginning new research investigating the effect gender imbalance and inequality in both industry and education has on the competitiveness of the UK game industries, in the hope of changing this. Existing research has found that a lack of diversity negatively affects competitiveness in the wider creative industries. This rings true to me. Clearly, if we're not fully harnessing the creative and entrepreneurial ability of 50% of the population, we're wasting talent and missing a trick.

There are concerns that Brexit is going to have a serious effect on the game industries, where much of the workforce in the UK comes for a global talent pool. In uncertain times we should ensure we develop homegrown talent. By engaging more girls to consider a career within the game industries we immediately increase the UK talent pool.

Do you think studios are doing enough to protect their female employees from harassment, and should they be doing more?

Things are getting better but some studios should be doing more. It's important to protect all your employees from bullying and harassment. The NextGen report surveyed 40% of women working in the UK game industries and found that 33% of those had experienced direct harassment or bullying at work, and many more had experienced it online. Depressingly, it also found that 69% of employers had no specific guidelines regarding online bullying, harassment and how to deal with them.

It's all about developing the right company culture; it starts at the top and should be present in all areas internally and externally. Clearly HR Policies are important, but more than that there needs to be active engagement with the issue from the senior teams.

It's been said before that publishers are afraid of putting a female lead in their games for fear of impacting sales – what would you say to these publishers?

Lara Croft, and Faith Connors in *Mirror's Edge*, Jade from *Beyond Good and Evil*, the wonderful GlaDOS in *Portal* or Bonnie Macfarlane from *Red Dead Redemption*.

All these female characters are strong and interesting leads and the games they featured in were all hugely successful. I can't really believe that this is still a concern. If we look outside games, at wider culture, we can see how an appetite for strong and multi-dimensional female leads has contributed to the success of a whole genre: Nordic Noir.

These programmes have become a phenomenon precisely because of female characters such as Sarah Lund (The Killing) and Saga Noren (The Bridge). There's no reason games can't be successful with these kind of well-rounded and complex female characters in them. It just takes thought, effort – and going back to my original point – a realisation that both the sector and its audience have changed.

> “
> **It's all about developing the right company culture; it starts at the top**
> *Marie-Claire Isaaman, CEO Women in Games*

While the competitive eSports scene is booming, it's still overwhelmingly a boys' club. Do you see this changing at all any time soon?

I do see esports rapidly evolving. As a form of competitive entertainment, it has grown up on the fringes of sport and video games and is fast professionalizing. Unlike other sports, where physical make-up can hinder an equal playing field, esports actually levels that field. But the competitive culture has grown up with a predominantly male demographic and the online community can be very brutal.

Women in esports have received rape threats and experienced other abuse, particularly online. This is never acceptable. Ever. To counter this, women are engaging in women only tournaments to build their skills and confidence. Twitch specifically - the game streaming site – is working hard at tackling online abuse.

The esports competition environment has developed as a predominantly male arena, a giant boxing ring where the players fight with keyboard and mouse. The audiences are usually 95% male and the products and services have been designed with this particular audience in mind, it's a tough environment to be in as a woman and only 5% of the crowd. From a skills perspective there's no reason that you couldn't have mixed teams. Mark Religioso, the Brand Manager at Bandai Namco Entertainment has said that there is a need to make the esports scene a more welcoming place for women, and is setting up what he calls the 'Bonnie and Clyde' tournaments with equal gender balance in teams, as-well as launching a mentoring programme to attract more women into this sector.

Many organizations are being set-up to support the professionalization of esports. In the UK, The British Esports Association was founded in 2017. This is a not-for-profit organisation designed to support and promote grassroots esports in the UK, chaired by Andy Payne. Carleigh Morgan – a member of the Women in Games Board and a Fulbright Scholar at King's College – is researching this field and on the Advisory Board.

The European Women in Games Conference 2016 had a panel event, Expanding Horizons, which focused on esports. We are raising awareness of this area and encouraging debate and action. So, I think with us, the British Esports Association and others worldwide, there's a real possibility esports will become more accessible to women and realise its full potential. ■

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'FOLLOWING UP ON YOUR NETWORKING IS THE MOST IMPORTANT BIT'

Recruitment firms OPM Response and Aardvark Swift give **Marie Dealessandri** some tips on how to follow up on your networking introductions after a gaming event

Being an aspiring dev going to an event, meeting other developers from the global industry and handing out business cards is the easy part. But once you've collected all these business cards, what's the next step to make the most of that event once you're back home and in the office?

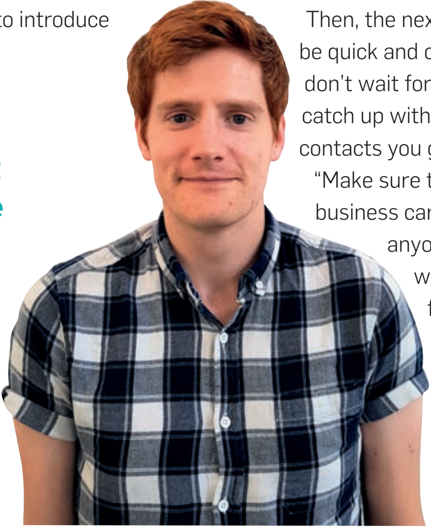
Nathan Adcock, PR and marketing manager at recruitment consultancy OPM, says, "following up on your networking is actually the most important bit – it can be a waste of time meeting these people in the first place if you're not going to follow up after."

To avoid wasting your time, the preparation to an event is key, according to Aardvark Swift Recruitment's MD, Ian Goodall.

"The best piece of advice I can give is to do your research beforehand. Find out who's going, if there's anyone you already know and who you want to talk to," he tells Develop. "Consider doubling up with a friend if you're nervous. You'll feel more at ease and conversation will come more naturally. This can benefit you further as you'll be able to introduce each other to contacts you know.

> **It's important to remind the person of the conversation you had**
>
> *Nathan Adcock*

"The other piece of advice I have to give is to prepare your pitch. Give some thought as to who you are, how you want to introduce yourself and why you're attending the event – work this into a couple of short sentences to introduce yourself."



Then, the next step is to be quick and clear – don't wait for months to catch up with the contacts you gathered.

"Make sure to get business cards from anyone you want to follow up with, and email them as soon as possible after the event to arrange a phone call," Goodall continues. "They'll likely be multiple people wanting contact the same people and you need to be the first to get their attention."

Once again, take some time to prepare a pitch to introduce yourself again if needed and don't hesitate to make good use of social networks.

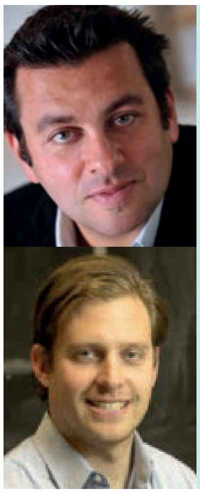
"It's important to remind the person of the conversation you had, they could have met 50 people at the event and probably won't remember everyone," Adcock explains.

"If you don't get a response from an email, maybe try another method of contacting them. Busy people have busy inboxes and emails can get lost forever.

"Your best bet might be to contact them on Twitter or LinkedIn where some people are much more likely to respond." ■

MOVERS AND SHAKERS

The latest high-profile hires and promotions



IMPROBABLE

SpatialOS creator Improbable has hired **ROB MILLER** as its first chief legal officer and **MICHAEL BANNON** as its first chief financial officer.

Miller joins from King where he was CLO and corporate secretary and was instrumental in King's acquisition by Activision Blizzard. Before that, he worked for the likes of Skype, eBay and BT.

Meanwhile, Bannon joins from investment firm TPG Capital where he worked for over 12 tears as principal and head of consumer.

Both joined as Improbable has expanded to the US with a new San Francisco office.

COOPERATIVE INNOVATIONS

The new Leeds-based VR studio has made three key recruitments, as **CHRIS TARRANT**, **FRAN BOOT** and **MIKE JEFFREY** joined late in March.

Tarrant joins from 360 studios, where he was the lead animator for a year, having previously worked as a 3D animator at Four Door Lemon for over three years.

Technical designer Boot is best known for being the creator of VR experience *The Caretaker*, inspired by The Shining, and previously was a digital designer at Milk Design.

Meanwhile, Jeffrey joins Cooperative Innovations as art director after spending 12 years at BioWare working on *Mass Effect* and, more recently, at Capcom on *Dead Rising*.

HUTCH

The London-based mobile developer has hired **ANISA SANUSI**, one of Develop's 30 Under 30 from last year, as its new UI/UX designer. She joins from Frontier where she worked for the past three years as a UI artist.

Sanusi is also known for being an advocate for diversity in games and as a member of the BAFTA Crew Games. She was also a speaker at the very first UX Summit held at GDC in San Francisco this year. Hutch recently raised a $5.5m (£4.3m) investment co-led by Index Ventures and Backed VC.

KISS

Indie publisher Kiss Ltd has appointed **MARK BOOTE** as non-exec financial officer, through its relationship with The Digital Funders.

Boote was previously managing partner at the investment firm and brings 20 years of senior financial experience to Kiss.

CEO Darryl Still commented: "Being able to appoint a person of Mark's calibre is testimony to just how much Kiss Ltd has evolved and grown over the last 4 years."

As CCP Games further expands from its space MMO property and looks for new talents, **Marie Dealessandri** catches up with senior talent acquisition specialist Marina Dögg Pledel Jónsdóttir to learn more about the perks available at the Icelandic firm

To say that CCP is on the rise would be an understatement. Already behind the hugely popular MMO *EVE Online*, the Icelandic company jumped on the VR train last year with triple-A title *EVE: Valkyrie*, as well as *Gunjack*. The latter, as of February, has sold over half a million copies – which can be considered a massive success for a VR game.

"Our early investment in VR gaming has positioned CCP well to take advantage of what we think will be a revolution in the industry," senior talent acquisition specialist Marina Dögg Pledel Jónsdóttir tells Develop. "We have made a number of bets that we've learned from, and are committed to the space.

"In addition, we recently added a free-to-play option to *EVE Online*, and that has given a lot of people an opportunity to check the game out and, we hope, become long-term players."

As a result of this growth, CCP opened a new office in London in September last year, becoming the fifth studio for the company which also has offices in Newcastle, Shanghai, Atlanta and, of course, Reykjavik. "Opening the London office means that we are recruiting more than we have in the past. Also, releasing more games means more open positions.

"The more specific the skillset we are looking for is, the harder it can be to recruit to locations like Atlanta, Newcastle, Reykjavík and even Shanghai, but that is not something that has changed, it´s more about the volume.

"Having said that, it´s not necessarily the location – we have noticed that some experts are just harder to find in general, wherever you are based. Examples of that are specific engineers, VFX artists and people who are smart about monetization." So if you happen to have a specific skillset that might

"IT'S ALL ABOUT PASSION, CURIOSITY AND DRIVE"

be of interest for CCP, now is the time to apply.

"I don't think there's any magic to this," Jónsdóttir answers when asked about what devs should prioritise to land a job at CCP. "Do your homework, learn about the company and the position you're applying for, and submit a CV that's suited for the role. It doesn't hurt to know people who already work at the company of course, but that's not required."

As for the job interview, demonstrating passion is, as always in games, a key requirement.

"The most important thing is to be yourself," Jónsdóttir explains. "It doesn't help anyone to try to be someone you think we want. We want people who are passionate about the company, the industry, the project, and their work. Ask smart questions,that demonstrate that you know something about the company and the role.

"It´s really all about passion, curiosity and drive. The best candidates are sincere and honest about who they are, but what makes the best interviewees the best is their ability to make you really feel their desire to work for CCP even if they know they are not a perfect fit for the role. They have researched everything they can about CCP, they have read the job description many times and they ask really smart questions. No one is perfect, but your passion and curiosity will bring you far."

SWORDS AND FUN CLUB

If your passion and curiosity brought you as far as being hired by CCP, the company has multiple perks available so that its staff can work in the best conditions. "We have the usual stuff, like decked out cantinas that serve great food. We also have a team of people at each of our studios called Fun Club that thinks about fun stuff to do like ski trips, movie and bowling nights, cooking classes, and so on," Jónsdóttir lists.

> When you hit your 10-year anniversary you get a sword. We are vikings after all
>
> *Marina Dögg Pledel Jónsdóttir*

"Several of our studios offer incentives to use alternative means like public transport, biking, to avoid driving to work. And in Iceland there are dozens and dozens of local businesses that offer discounts to CCP employees."

And the greatest perk of all: "Plus swords. When you hit your 10-year anniversary you get a sword. We are Vikings after all." The company also has its staff's well being at heart.

"We put a huge focus on our people, and have a number of efforts to make sure everyone has an opportunity to develop and grow," Jónsdóttir continues. "We probably offer a little more flexibility than most studios with regards to teams and locations as well if that's something they're interested in.

"We also try to give every employee the feeling that they are empowered to express their opinions – not just on their teams, but also to our executive team."

JUMPING INTO VR

Working at CCP obviously also means having the opportunity to work on some pretty exciting projects.

"We have several games at various stages of development in all our studios," Jónsdóttir says. "Of course *EVE Online* continues to be developed in Reykjavik, and we just announced *Sparc*, a new VR sport, which is in development in our Atlanta studio. CCP Newcastle released *EVE: Valkyrie* just about a year ago, and we've updated it several times since, with more content on the way. Our Shanghai team has been focused on mobile VR, releasing both *Gunjack* and *Gunjack II* in the last 18 months or so, and we're building a development team in our newest office in London."

Being on the cutting edge of VR development, CCP represents a good opportunity for skillful devs ready to make the leap to VR or improve their VR development skills.

"Working at CCP is very much an adventure," Jónsdóttir concludes. "We do things a little differently than bigger developers/publishers and we're one of the few that has been willing to jump into something like VR development with both feet. There's no 'playbook' at CCP about the games we develop, the people we hire, or the way we talk." ■

GET THAT **JOB**

This month: Engine programmer with Epic Games' **Jurre de Baare** talks about his role

What is your job role?

I am an engine programmer, with a particular focus on animation and tools. Some of the features I have worked on include the vertex animation pipeline using Alembic and the Hierarchical LOD system used in *Paragon*.

What qualifications and/or experience do you need?

First of all, you're expected to have an interest in video games, whether you enjoy playing or picking them apart doesn't matter. Of course, strong programming skills are important, in particular being able to work with C++ as this is the industry standard and knowing additional programming languages is a plus. A solid understanding of the fundamentals of Mathematics and Physics is valued a lot, since you'll be using theory and concepts from these fields daily. You will be working with people from different backgrounds and disciplines, both within and outside of Epic, having an open and team-focused attitude is key. If you tick all boxes above I'm sure you'd fit right in.

How would someone come to be in your position?

Try and engage with the industry, there are lots of events and meet-ups which you can be part of, allowing you to meet people who may be able to help you find a job. For example, my university teacher had an old colleague who now works at Epic Games, whom he showed some of my work to. This got the ball rolling. Getting your foot in the door is the hardest part, but once you're in your knowledge, experience and network expands after which the rest will follow. Work hard and don't give up, it will pay off.

> There is nothing more rewarding than seeing hard work come together
>
> *Jurre de Baare*

If you were interviewing someone, what would you look for?

Being confident in your own core set of skills can make a big difference when deciding whether or not there is a fit. Especially as the interview process contains practical parts, including a technical assignment to give a better impression of your skills and a session where you are put on the spot to solve problems on a whiteboard. In addition, being able to not only think about the technical problems we are faced with today, but also envisioning the next step on an industry-scale is important at Epic.

What opportunities are there for career progression?

There are a lot of options for progression. First of all growing into a senior programming role, which means taking on more responsibility and tasks, and from there on multiple paths. Taking on the position of team lead or moving into a producer or manager role, it simply comes down to your ambitions and interest.

Why choose to follow a career in your field?

For me the appeal of tinkering with computers has always existed. Being a programmer also means being responsible for the core parts of the game and I think there is nothing more rewarding than seeing the hard work from different people come together. ■

SKILLS AND TRAINING

This month: Games partnership manager **Marcia Deakin** details NextGen Skills Academy's course backed by the games and VFX industries

Overview: NextGen created a college course backed by the games, animation and VFX industries, currently running in four colleges (Sunderland, Truro, Uxbridge, NESCOT), with more to come in September.

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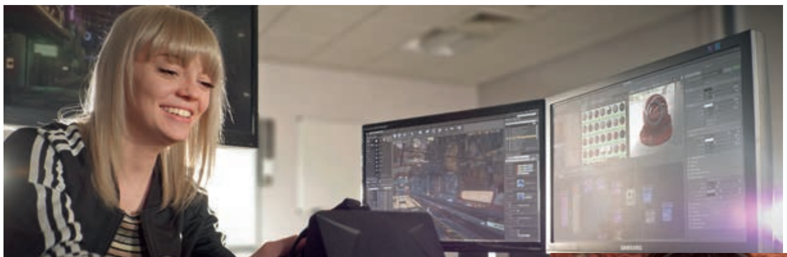
NextGen Skills Academy is an industry-backed initiative offering courses to various colleges across the UK. "We work with selected further education colleges to offer a two year, Extended Diploma in Games, Animation and VFX skills," Games partnership manager Marcia Deakin explains.

"This Level 3 course is currently running at Truro & Penwith College, Uxbridge College, Sunderland College and NESCOT College in Surrey. The course has UCAS points, comparable to 3 A levels, and will prepare students to go on to higher education, apprenticeships or into employment."

NextGen's strength is obviously its close links to the industry, allowing the course to be tailored by triple-A studios, Deakin continues.



"Our course has been exclusively designed by the games, animation and VFX industries. We work with companies including Sony, Microsoft, Ubisoft, Framestore, Double Negative and Blue Zoo. They focused on the fundamental skills students will need to work effectively in these industries, including storytelling, art, design, programming and commercial skills. They identified that a view of the whole production pipeline is essential, even as the students go on to specialise in the future."

This close link to the industry also allows NextGen to work hand-in-hand with local companies to provide lectures.

"[We have] both local and national [partnerships]. We work with companies all over the country, and arrange for employers to go into college and deliver interactive sessions with students. These have included Scrum training, 3D modelling, compositing and pitch presentations to publishers. We also do master classes and Q&A sessions by Skype if they are too far away."

NextGen only run courses in colleges that have "close to professional standard equipment" and is looking to expand its partners.

"We expect to have at least 10 colleges running the course in September 2017," Deakin says."We recommend that you keep eye an on our website and contact the college closest to you directly." ■

RECRUITER **HOT** SEAT

Technical recruiter **Justin Ghio** discusses the recruitment process at Amazon Game Studios, which just opened a brand new office in San Diego and will soon be opening another in Europe

What differentiates your studio from other developers?

Amazon's mission is to be the world's most customer-centric company. With a history of big bets and long-term thinking, we're obsessed with innovating on behalf of our customers in everything we do.

In games, we see an incredible opportunity to connect massive global communities with bold new experiences that are only possible with the power of the AWS Cloud and Twitch.

How many staff are you looking to take on?

We're currently looking to fill more than 100 jobs. We're always looking for talented people to join the team, and are growing fast in all disciplines at multiple locations around the world. Are you interested in making great games with us in Seattle, Southern California, Austin, or a new European location coming soon? We want to hear from you!

What perks are available to working at your studio?

Each studio has unique perks and culture, but the main draw is our commitment to long-term thinking and investment, innovation on behalf of our customers, and a shared love of games and gaming culture.

What advice would you give for a successful interview at your studio?

Come in and share your passion with us. Let us know what inspires you. And ask us lots of questions.

It also helps if you're familiar with our leadership principles that guide everything we do at Amazon.

> “We're always looking for talented, passionate people
>
> *Justin Ghio, Amazon Game Studios*

Who is the best interviewee you have ever had and how did they impress you?

We're always looking for talented, passionate people that share our obsession for innovating on behalf of our customers. So come tell us what you're passionate about. Dress comfortably. Be ready to ask questions of your own. The best candidates also come ready to share stories from their career which demonstrate that they're passionate about the same things we are – even when that means learning from mistakes and challenging experiences.

And who was the worst?

We advise candidates to take the fundamentals seriously. Don't be late. Don't forget to read up on our Leadership Principals. Common sense, really.

If you have recruited internationally what is the process like?

Several times a year we host an international hiring event, but if you see a job you're interested in, we encourage you to apply now.

How have recruitment needs changed at your studio?

In 2016, Amazon Game Studios announced three games, with additional unannounced projects being developed in our Seattle, Orange County, and San Diego locations. We're hiring across all disciplines, especially in engineering and technical leadership. We're growing fast.

Why should developers join you when indie and self-publishing have become so much more accessible?

Amazon has a long history of making big, long-term bets fueled by innovation for our customers. Our developers have access to Amazon's powerful development ecosystem including Lumberyard, the AWS Cloud, and Twitch to create daring experiences for global communities at massive scales. If that sounds like something you want to be a part of, we want to hear from you. ■

CURRENTLY HIRING

Company: Amazon Game Studios

Location: Orange County (California, US), Seattle (Washington, US), San Diego (California, US), Austin (Texas, US), San Francisco (California, US), London (UK)

Hiring: Over 100 open positions across the different studios in various disciplines including engineering and technical leadership.

Where to apply: games.amazon.com/careers

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ASK AMIQUS

Liz Prince, business manager at recruitment specialist Amiqus, helps solve some of the trickier problems job seekers currently face in the games industry

Q Dear Amiqus, Should I hire someone full time or would contracting be a better approach for our project?

Whatever the size of your studio, the decision to hire always needs great care and attention. The short answer to the perm or contract question is that it depends on whether you have a short or long-term need for those skills. However, there are many factors to consider when deciding whether permanent or contract is the way to go.

The permanent option

If you can foresee an on going demand in to your company's future then it's possible that a permanent hire would be the most cost effective solution long term. A permanent member of the team will be on your payroll, add to your headcount and brings the responsibilities that this entails around their wellbeing at work as well as the cost implications of employers NI, holiday and sick pay etc. You will also need to keep their skills up to date through training and development. If you want to grow your company employees and capacity over the long term then adding to your perm headcount will make a positive impact to this. However many studios find themselves wanting skills but for many reason aren't ready to commit to a permanent hire. If you find yourself in this boat, a contractor could be the way forward.

The contractor option

A contractor is someone employed to work in your team for a flexible period of time typically 3 months upward though many are kept up for 6 or even 12 months. They are experienced games professionals who bring a specific expertise in to your project only when it's needed and they leave the team when the work is done. When you hire a contractor you know up front that these skills don't 'belong' to you, you are hiring them only for a period of time but that your can gain a lasting benefit. Comparing hour by hour a contractor is typically more expensive than a permanent employee's salary though this is offset by the lack of associated employment costs, the shorter time-commitment and higher flexibility of deployment.

Typically freelancers have experienced a wide variety of projects and understand the need to present project-critical deliverables. They're used to assimilating in to a variety of studio environments quickly and they can hit the ground running right from the off; there's no induction or development plans to worry about. Due to their employment preference, contractors have a naturally high awareness of their employability and work hard to keep their skills-base sharp and up to date.

Who uses contractors?

Studios right across the industry use contractors for different reasons. After all, no-one can afford to be paying people who are not utilised however no-one wants a 'hire and fire' reputation and using contractors mitigates the risk of having to let people go.

For many studios, their first taste of freelancers is when something unforeseen puts key milestones at risk and someone is needed quickly to get over a key milestone or catch up on a drifting deadline. Nasty surprises can pop up at any time, such as the resignation of a key team member, accidents, illness, or business hazards such as movements in publishing dates or being let down by suppliers. Where there is a high turnover of project variety and constantly changing demand, contractors can be used as part of a long-term resource strategy, such as outsource businesses. For some, specialist skills are only needed at key points in the lifecycle and don't warrant a full time demand. The beauty of freelancers in this scenario is that in-house capability is never a restriction to your ambitions, you just bring in the skills when you've won the work and ramp up the team when you need to. Moreover contractors can be brought in as part of your business development strategy and can make a key contribution to bid for work for hire or to a prospective publisher to showcase a new game.

> Contractors have a naturally high awareness of their employability and work hard to keep up to date

Using the contractor model can be a great way to go for start-ups with uncertain investment milestones and who don't want to add to their fixed cost overheads. Getting the work done without adding to headcount can be a real bonus, and if it's not working out you can part company very quickly.

The benefits of contractors

Whereas a permanent hire will bring long-term capability, growth and expansion to your team, contractors offer several short-term benefits to be considered:

- *Skills* – get key skills through the door and get the work done on-demand.
- *Flexibility* - ramp team numbers up and down when you need it.
- *Speed* – shorter time to hire. It's even possible to hire is less than 24 hours.
- *Simplicity* - no redundancies, contracts end on a date or on a notice period.
- *Experience* – contract staff hit the ground running and management overhead is minimal.
- *No fixed overheads* - no payroll or National Insurance costs and no HR time.

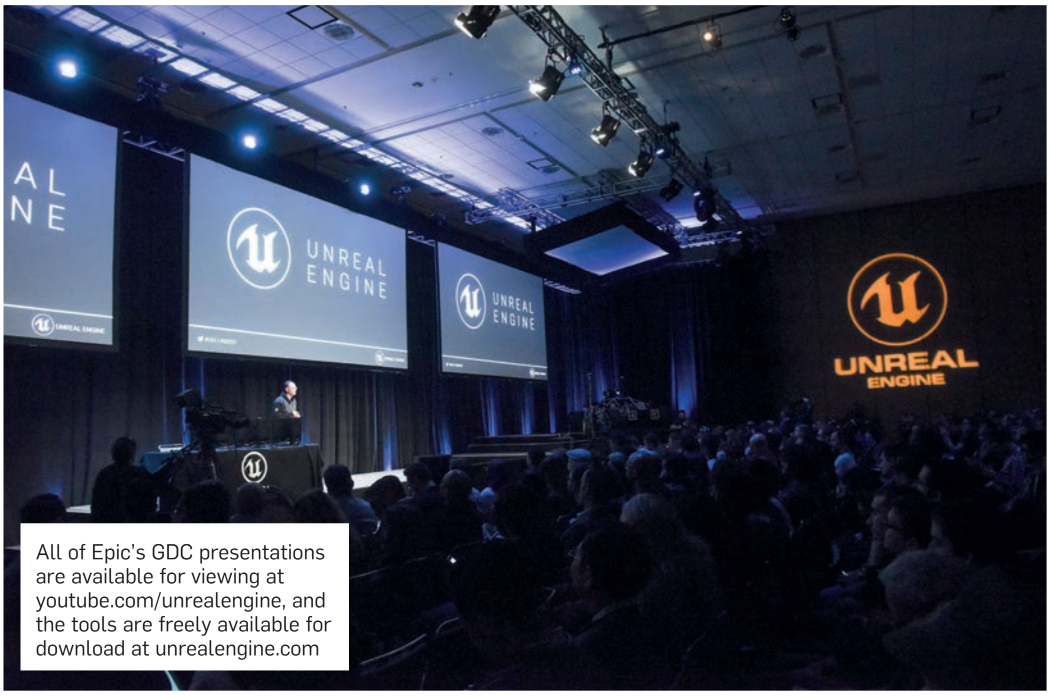
In our experience many studios successfully deploy a combination of permanent and contract staff to fulfil their project demands. The key is to put in due diligence around planning what you need, when and how long for to meet your goals. ■

Liz Prince, business manager at recruitment specialist Amiqus, helps solve some of the trickier problems job seekers currently face in the games industry

amiqus Visit **amiqus.com** for a fresh perspective on games recruitment

AN UNREAL **FUTURE**

Following their GDC presentation, **Unreal Engine** Gets Upgrades in rendering, audio, animation and physics



All of Epic's GDC presentations are available for viewing at youtube.com/unrealengine, and the tools are freely available for download at unrealengine.com

At the Game Developers Conference in San Francisco, Epic Games proved how Unreal Engine 4 continues to advance the state of the art for the industry with convincing demonstrations. Demonstrated was a preview of a new *Borderlands* environment from Gearbox Software, and also through the reveal of The Human Race, an augmented reality and real-time cinematic collaboration with Chevrolet and The Mill.

Also notable is how small teams are using Unreal to leap ahead, as seen with *Astroneer* and the newly released *PlayerUnknown's Battlegrounds*, both of which launched at the top of the Steam charts, by System Era and Bluehole, respectively.

At the same time, established teams are finding that only Unreal ships with the requirements needed to scale games in ways previously unimaginable, as seen with Netmarble's number one-grossing mobile MMORPG title, *Lineage II: Revolution* for Android and iOS.

Flying under the radar, though, were a number of technical presentations that significantly impact developers through their revelations in what is now achievable with Unreal Engine by way of rendering, audio, animation and physics.

Ryan Brucks, principal technical artist at Epic, demonstrated new workflows for content-driven multipass rendering, which gives artists and designers the ability to script drawing to render targets through blueprints in order to create and prototype advanced rendering techniques that would have previously required a graphics programmer. This opens the floodgates to many possibilities, such as custom fluid simulation, surface deformation and caustics rendering, for starters.

> **“That kind of interaction with our devleoper community is one of the higlights of working at Epic**
> *James Golding, Epic*

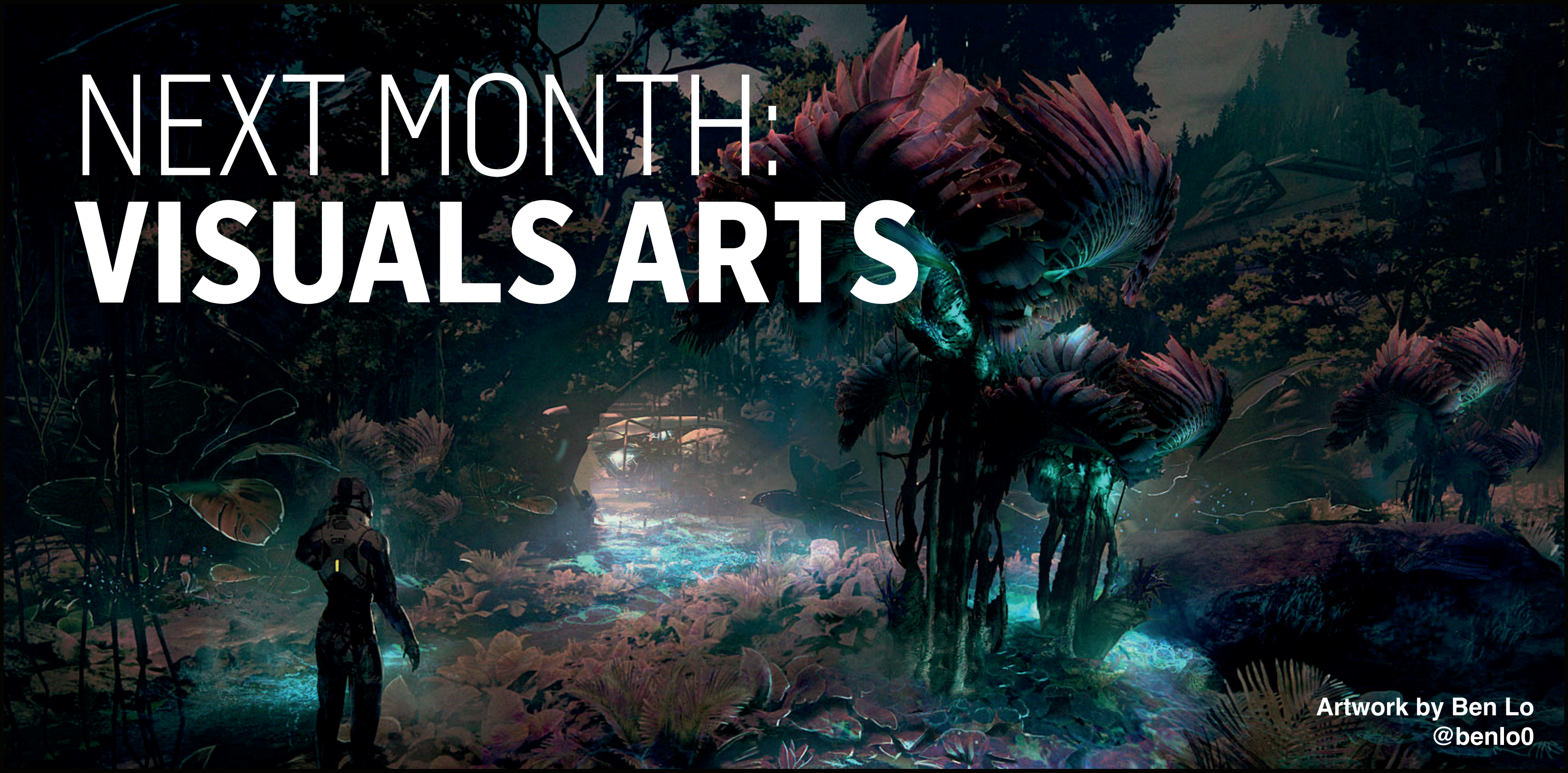
Aaron McLeran, Epic's senior audio programmer, revealed the new multiplatform Unreal Audio Engine, which augments UE4's entire audio system. With many features already rolled out in Unreal Engine 4.15, the new audio renderer will bring real-time synthesis, dynamic DSP effects and physical audio propagation modelling to 4.16, coming soon. In his talk, McLeran showed how to create a synthesiser from scratch and play within a level in 30 seconds, among other demonstrations.

In Epic's animation and physics technical showcase, lead programmer James Golding and several other speakers demonstrated new workflows for previewing and editing animation, new tools for creating physics simulations with improved quality and performance, and other ways to enhance the calibre of digital characters with the goal of empowering teams of all sizes to easily make cutting-edge, engaging experiences.

During this session, 3Lateral presented Gene Splicer, which takes an inventive approach to parametric modelling of avatars embedded in Unreal Engine, and is both a production and runtime solution for democratising high-end character rigs. Gene Splicer evaluates the appropriate rig for the animated avatar created by user in a process that transpires in milliseconds. The solution is based on a deep inventory of scanned humans, and through this database approach truly unique characters are generated with appropriate facial gestures for their anatomy, all while maintaining the ability to use the same animation across the created population. This technology is not just high quality, but is also highly optimised for both high-end cinematics and VR applications.

“The animation and physics team, which I lead, had a great GDC,” said Golding. “The highlight was having our developers present features they've been working on over the last few months. We've had a lot of conversations since the show, and we're excited to take that feedback and continue to develop these features so that we can deliver them in upcoming versions of the engine. That kind of interaction with our developer community is one of the highlights of working at Epic.”■

NEXT MONTH:
VISUALS ARTS



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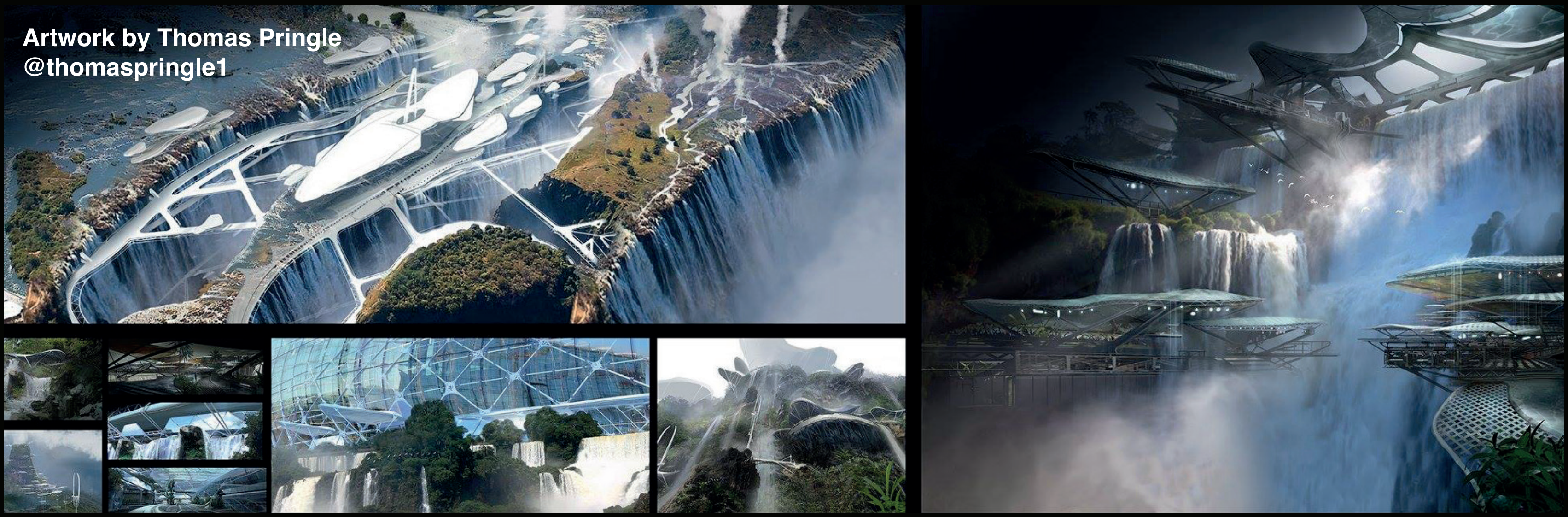

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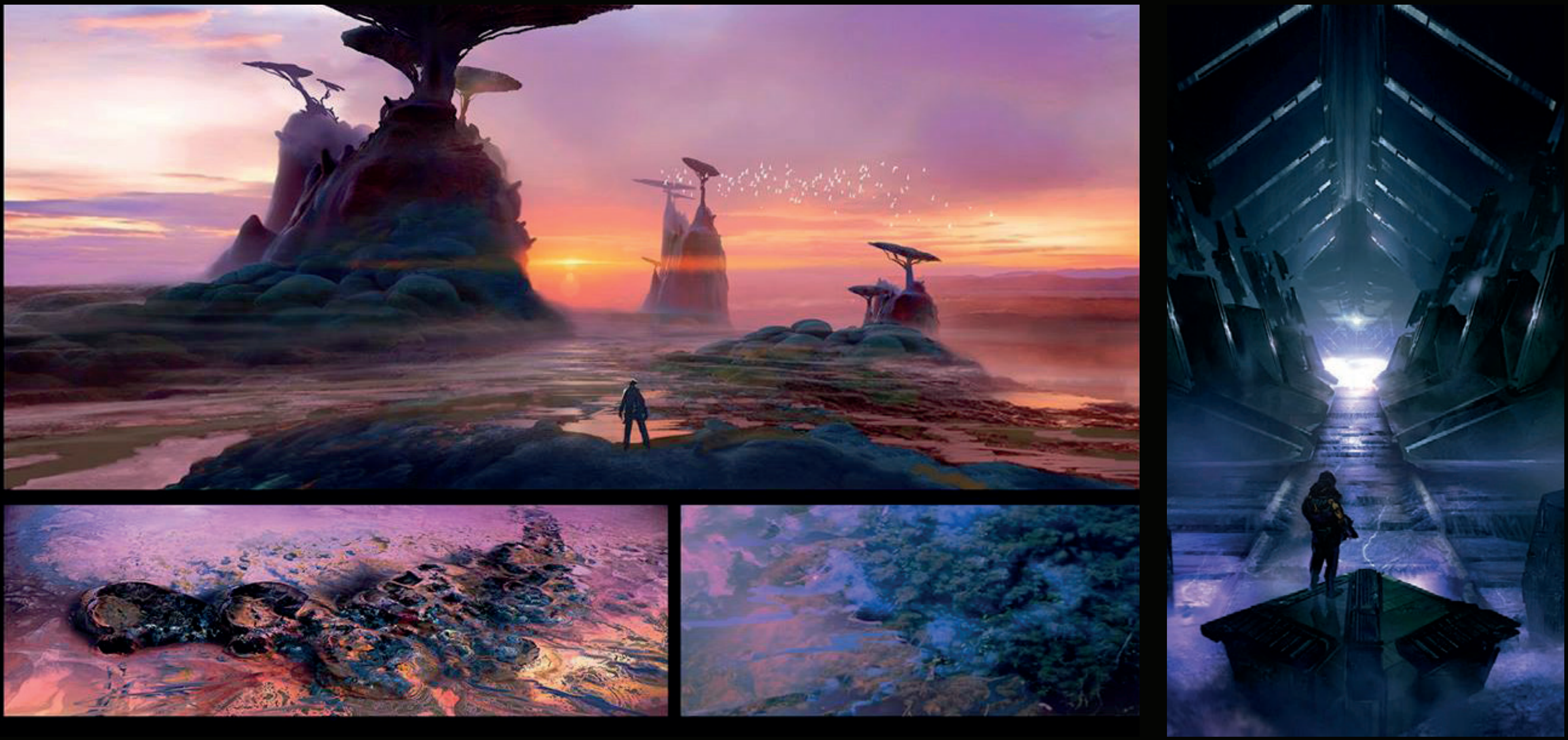
@thomaspringle1



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